High-tech firms share know-how

by Elleeo Stainer

EUROPEAN and American electronics and computer companies have set up a consortium for the sharing of new technology. The project is similar to the nine-company VLSI venture in Japan which is run by MITI, the Ministry of International Trade and Industry.

Operating under the name of Stack with its headquarters in Woking, the consortium is an organisation of manufacturers in advanced electronic equipment. Its objective is to enhance large-scale integrated (LSI) and VLSI circuit development outside Japan by sharing information. Other bases are thought to exist in Germany and Italy.

Companies participating in Stack each have one or two representatives who attend regular discussion meetings. According to the GEC representative, John Whiteley of the Hirst Research Centre, who returned from the lastest meeting early this week, the meetings are reminiscent of a users' club.

Problems that each company experiences in the development of certain advanced LSI components like memories and microprocessors are discussed at the meetings, and each participating company benefits from the others' experiences.

According to another spokesman, Stack sets a target achievement which is not likely to be reached for many years to encourage companies to share their knowledge and to work harder trying to achieve the aim. One past aim was the 64K dynamic RAM.

Now, Stack is concentrating on further development of uncommitted logic arrays, an area which interests both GEC and Racal, two of its participating companies. Other companies participating are thought to be Nixdorf, Siemens, ICL, Control Data, Plessey and British Telecom. GEC joined Stack last September.

Members of Stack are said to pay an annual subscription, although no one from Stack would confirm this. The organisation is run by John Hayden, who is managing director, and John James, technical director.

Network trials nearing end

by Dunald Konnett

LONDON-BASED Incal networking company Xionics plans to complete the first six trial installations of its Xinet office automation networking system by the end of March.

Development of the system began when Mike Bevan set up the company at the end of 1978 and has largely been funded by advances from these first six customers, following a Department of Industry Microprocessor Application Project grant for the initial work.

Since then Xionics has grown to a 24-man company and the latest injection of capital has come from Meritor Investments, a subsidiary of Midland Bank and Rolls-Royce Pension Trust. It totals £290,000 and includes the purchase of a 25% stake from a minority shareholder.

Xinet is designed to provide reliable access to a variety of resources via multi-function terminals spread throughout an organisation. All the elements of the system are duplicated, from the power supply and the cable up.

Xerox profit margins slip

DESPITE a 10% increase in profit for 1980, to $619.2 million on turnover of $8.2 billion, profit margins at Xerox Corp slipped from 18.3% to 16.5%.

The copier and word processing manufacturer also revealed that one of its finance subsidiaries will be borrowing up to $160 million to help the parent Xerox Corp finance customer installations. The latter also expects to go out for its first domestic financing since 1974. This will be for a sum of $200 million to replace existing loans which mature during 1981.

The slip in profit margins was attributed to a shortage of some copier products and difficulties with the 3300 copier technology.

Sales of the company's word processors, which rival IBM particularly in the US, were on target.

TSI broadens its base and moves away from IBM

AS part of its strategy to become one of the top three software products houses in the world by 1983, TSI — the software products division of Dun & Bradstreet — has taken over Programme Products Inc and is to make more of its packages available for non-IBM kit.

BENNETT . . . feels no firm can continue to rely exclusively on the IBM market.

The deal, worth over £1 million, adds three products to the TSI stable. These are Data Analyser, which has over 500 users worldwide and allows users to create and submit part requests via an online video terminal; Audit Analyser, which allows DP auditors to retrieve data they want to examine; and Project Monitor which is a user-friendly project control system that can gather and report progress to as many as eight hierarchical levels within a company.

TSI's European general manager, Mark Bennett, said the reason PPI had been taken over was that it had the best "fit" into his existing product line of Task/-Master, Key/Master, KICS/MM, Docu/Master and Owl. The existing PPI distributors are to be dropped.

Dun & Bradstreet's strategy was to expand in Europe and to have a more aggressive sales objective, said Bennett. TSI has a target of £1.5 million revenue for the 1981 financial year. The figure for the previous period was £800,000. To achieve its target to become one of the top three, TSI is aiming at a worldwide turnover of £25 million by 1983.

Bennett added that had TSI's bid been unsuccessful, it would have pursued bids for other similar firms. PPI was originally owned by Information Sciences.

He said TSI was a market research oriented firm and that it had the next three years mapped out. It hoped to acquire a US applications firm as well this year.

TSI is also expanding its operations in Europe with the opening of a Scandinavian sales office in the summer and a software factory at Dublin which will create over 50 new jobs. TSI expects to produce all its new software there for worldwide distribution.

Bennett said that originally TSI was heavily IBM oriented, but now no firm could continue to rely on this market exclusively. He said that whatever happened to plug compatible manufacturers such as Amdahl or Magnuson, IBM appeared to be trying to get account control back via the 4300 line.

He also hoped to make more of TSI's products available for the popular makes of minicomputers and non-IBM mainframes.

Loyalty of IBM users

by Kevin Cahill

A SURVEY of communications in Western Europe has revealed marked differences in the expected loyalty of IBM and ICL users when they come to replace the CPUs at the heart of their distributed processing networks.

The survey shows that of ICL users which responded and are planning a change of CPU within the next 48 months, some 41% intend to stay loyal, with 47% undecided. This compares with 79% of IBM users intending to change systems but remain with IBM.

Other aspects of the report show that the communications equipment and services market in Western Europe grew by 26% in 1980 to total $1,453 million, of which $120 million of it spent on external communications.

The fastest area for growth was in small business systems and minicomputers, up 45% on last year and predicted by the survey to keep on growing over the next few years.

Eurocost Communications Service in Western Europe, IDC Europe, 7 Bath Road, London W4 1LY. Price £1,250.

Apple buys its agent

THE sole distributor of Apple computers in the UK, Microsense Computers of Hemel Hempstead, is selling out to Apple Computer of California. Microsense will become a subsidiary of Apple, keeping on all of its 50 staff, including chairman Mike Brewer, director of marketing steve Greenfield and director of operations Dave Collins.

The company originally took over the distributorship in July 1979, and discussions concerning takeover were started in November of last year. Turnover for this year, according to Brewer, is expected to be in the region of £15 to £20 million.

Apple Computer, which recently went public in the US, is moving into Europe in a big way. A manufacturing plant has been set up in Cork, Ireland for the manufacture of Apple systems and their peripherals. A supporting distribution and marketing centre has been set up in Zeist, Holland.

No name change for Microsense has been planned yet, but Mike Brewer said that he rather liked the concept of Apple Computer UK.

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Computer Weekly
THE UNIVERSITY OF JORDAN LIBRARY
Thursday, February 19, 1981 Number 745 25p

Computer Weekly hits 100,000 circulation

100,000 copies circulated each week and substantial extra investment in the recession-breaking news from today's Computer Weekly.

We have become the first British computer publication to breach the six-figure circulation barrier and can now announce added investment in people and resources.

Both are designed to stretch our lead at the head of the market, a position established when Computer Weekly was launched as Britain's first computer newspaper in 1966.

This week also sees the introduction of our new title, together with a consolidation of design improvements introduced over the past few months. A change in the order of pages and new typefaces for headlines are included.

From this issue, all general news pages, together with the specialist Software File, Micro News and Company News, are grouped at the beginning of the paper.

They are followed by a spread of comment pages including the leader, readers' letters and the Downtime column, plus Don's inimitable Liveware File cartoon strip.

Then come more relaxed features on the working lives of programmers and operators, In Programmers Page and Op Spot respectively, followed by the People page to keep you up to date with who's on the move.

Special features, including the successful current series on Data Analysis, round off the main body of the editorial.

But don't forget to look for the Sales Bit at the back of the paper: if you're concerned with selling, Alan Williams provides an excellent reminder of the basics of life.

He will be new to many recent readers, including those just added to our circulation list, some of whom have been waiting for several months.

In fact, there are now more people receiving Computer Weekly in each of the major job categories — from directors through to operators — than any other journal. Extra sales executives have joined the team to meet the demands of advertisers.

The whole investment package marks our determination to keep growing to match growth in the industry and to continue providing the best possible news service and advertising platform for the largest possible number of readers.

Have a recession-breaking year.

First fruits of DP support programme

EEC aid backs Britain

by Donald Kennett

THE first round of awards under the EEC's long-awaited data processing support programme have brought backing to a joint Danish/British project. Some £280,000 of the £15 million fund will go to Regnecentralen in Denmark and SIA Ganymede in the UK to develop universal communications terminal software for open networking.

The National Computing Centre revealed last week it is also receiving support for collaborative studies on privacy, security and programming methods.

Project proposals were invited in February last year for submission by June and selection by the end of the year in this first round of awards, and a similar schedule is expected to start this month for the second round.

The first usable products from Regnecentralen and SIA are expected to emerge in 18 months in the form of portable real-time Pascal programs.

Designed to enable a terminal to attach to local or public networks, the software will use the Transport Service protocol defined by the European Computer Manufacturers' Association to fit into the International Standards Organisation's seven-layer architecture for Open Systems Interconnection.

Other high level protocols will be chosen to minimise later work when standards are fixed.

Regnecentralen and SIA Ganymede previously worked together on communications systems for the European Centre for Medium-Range Weather Forecasts.

Funding, a loan of 500,000 European Units of Account (£280,000) designed to cover half the development costs, falls under that section of the EEC programme which aims to help companies bring worthwhile competitive products of their choice to the market. The awards are made in

●Turn to back page

Software copyright expert and counsel Alistair Kelman advised SCT "not to take on the world."

ACT backs down on software injunction

by Keith Jones

HOPING to avoid the expense of being the UK's software copyright case law pioneer, ACT Microsoft has decided not to apply for an injunction against David Bolton, the private individual who sells Visicalc Backup. This is the floppy disc-based product that enables Apple users to make one copy of the business planning package, Visicalc.

ACT sells Visicalc in the UK on behalf of Personal Software of Sunnyvale, California, and stated its intention at the turn of the year to apply for an injunction stopping Bolton from selling his Backup product.

This decision was taken after ACT's counsel, software copyright specialist Alistair Kelman, found that Bolton was selling Visicalc Backup on a wholesale basis through the Lion House microcomputer stores as well as selling it directly to end users.

According to ACT, Bolton has now given undertakings that he will keep full accounts of all his sales of Visicalc Backup, including wholesale shipments, so that ACT's losses can be assessed accurately when the case eventually comes to full trial. Normally a customer must pay ACT the full £125 price of Visicalc if he wants a second copy while Bolton's Backup product will cost him less than £20 at Lion House.

ACT believes that it could now take two or three years for a full trial to come to the courts, and hopes that by then a similar case will already have been heard, providing a precedent.

An ACT spokesman commented: "ACT has a duty to its shareholders not to take on the world. There is no need for ACT to suffer because of a lack of legislation."

Claire Gooding adds: Last week it was revealed that the BBC is gathering evidence of software cases and problems in software protection to "discover whether the need for legislation is as urgent as it appears elsewhere."

The move follows the submission to the Directorate last September of a discussion paper from the European Computer Services Association which is backed by Barney Gibbens of CAP and Philippe Levi of CIGI.

The paper backs the views of Alistair Kelman that the word "transmutation" would provide a much-needed definition of the ownership of machine-processed information.

"Alistair's solution is an elegant one," said Gibbens. "It actually goes further than the recent US legislation."

Receiver at Hallmark

by Paul Fisher

LONDON OEM Hallmark Business Systems (HBS) went into liquidation on Tuesday, February 3 with debts estimated at £60,000. Barclays Bank, which called in the receiver, is owed $120,000.

HBS started trading in March 1978 as an AM Jacquard distributor. Hallmark Replicas, a mail order company, provided 30 per cent of the starting cash, the remainder being supplied by Anthony Wainwright, a Hallmark Replicas director and Tony Cooke, who became managing director of HBS.

The company had a turnover of £250,000 in its first year of trading and £500,000 in its second year. A £1 million turnover had been anticipated for this financial year, but business slackened during the summer. In March 1980 HBS took on the distributorship of Honeywell Level 6 kit.

"We were trying to expand at a time of recession," says Cooke.

Shortly after the receiver moved

● Turn to page 5

IN THIS ISSUE . . .

CAP directors deny job security pledge

by Claire Gooding

SEVENTY people at software house CAP are to lose their jobs, despite the belief of many after the December 1 annual general meeting that there would be no more redundancies after the loss of the mainframe products arm CPP.

Group operations director Mike Smith denied that there was any promise at the annual meeting about the safety of jobs. "Any management would be mad to make such a black and white statement," he told Computer Weekly.

But it is clear that many employees got the impression from the mood of the meeting that their jobs were safe, although some administrative cuts were inevitable. Smith has now circulated a memo to CAP staff, saying that he is confident there will be no more redundancies.

"People think things were said that in fact weren't," explained personnel director Graham Elliott. "They were looking for reassurance, and some came away with the wrong impression.

"No-one's happy about the redundancies but there seems to be a reasonable level of understanding. We're doing all we can to help, and have placed three people within four days."

In a statement last week Smith blamed the sale of CPP and the recent demerger of Alex d'Agapeyeff's Microproducts division (in which CAP wrote off £2.5 million) for the staff cuts, explaining the move as a "rationalisation of the structure of the group."

But further cuts in the company's staff levels (CAP dismissed its graduate intake last year as well as losing the CPP staff) indicate that the trouble at CAP goes deeper than the directors are prepared to admit.

Smith's statement admits that the recession has put pressure on the company, while implying that top-heavy administration is the main reason for the cuts.

In fact, CAP's traditional markets of large DP projects and "bodyshopping" of Cobol programmers have shrunk while its substantial outlay on ventures such as Microproducts and CPP's Inprove have failed to show a return. Of the 69 people losing their jobs nearly 50 are programmers.

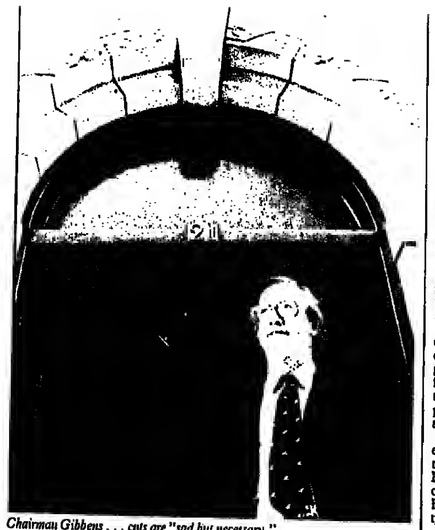
"It's a matter of genuine overcapacity," said Smith.

The company now has 850 staff.

Although CAP retains its reputation for quality work, the company is not helped by persistent City rumours that CAP has been rebuffing offers from its one-time European associate Cap-Gemini-Sogeti on the grounds that the price is too low.

Chairman Barney Gibbens, describing the cuts as "sad but necessary," remains optimistic about CAP's future.

"We'll come out of this lean, fit and hungry, and able to do the business we do the best".



Chairman Gibbens . . . cuts are "sad but necessary."

WP boo… aims to raise standard…

by Rory Johnston

"UNETHICAL" … word processing … needless clauses and … caused by ignorance … problems that have … group of five workers … to set up the Institute's … Processing.

They have opened a … office and aim to set … qualification for … ganise training and … formation in order, in the … the Institute's article … promote and uphold … standards.

The five founding … especially well-known … the DP world, including … Ron Thornton, NCR … of the Unilever subsidiary … Electronics and Hilger … typing supervisor at …

Membership will be … to individuals and … the group is being … involved with any … hopes to obtain financial … from a foundation.

Mrs Grainger is … secretary and lists … forms the Institute is … tackle the high-… salesmanship of … bined with buyers' … what they really need.

There is also the … operators being employed … having enough time … work and losing their … ensuing fracas.

"Girls have been … tears," Mrs Grainger …

She hopes the … able to establish a … duct information … pective buyers through … existing products, as … legal department.

The Institute has … with the established … Word Processing … the BCS WP specialist …

Some scepticism has … pressed by other … field over the Institute's … success. Mike Hamblin … tual Assurance, … ECS group, said he … what it would achieve, … since the technology … "fast moving target."

Mrs Grainger said that … the Institute was to "… idea of word processing … rified typing," and … understand in broader … cance.

The Institute's … 01-380 0386.

New database machine for launch this year

by Rory Johnston

A DATABASE computer of novel design that is intended to handle large volumes of data for transaction processing is being developed by a small company in Los Angeles.

Started by a former Xerox researcher, Teradata intends to launch its secret product, comprising original hardware and software, in about six months, to provide extended database management facilities at low cost.

Teradata's founder, Jack Shemer, was involved in information retrieval research when head of Xerox's Advanced Development Lab in Los Angeles. His product is intended for use either as a back-end processor on a mainframe or on its own, and can be used in either a large or small configuration. It will handle the management of data, sorting, security, recovery, and transformation of data.

Shemer has 22 employees now, culled from Xerox, Honeywell, California Institute of Technology, and Transaction Technology, where Shemer himself once worked.

Intel files employee piracy suit

by Eileen Stainer

FIVE former Intel employees are being charged with planning to use Intel trade secrets and confidential business information. It is claimed that they planned to produce and sell the company's 64K EEPROM, which is not yet on the market.

The former employees left Intel's special products division to form a company under the name of Seeq Inc. Intel has filed suit against Seeq in the Santa Clara County Superior Court in California, alleging that the four were among the few individuals who had access to secrets surrounding the development of the 2864 EEPROM chip.

● In Santa Clara recently two men have been charged with selling 10,000 defective Intel memory chips which had been stolen in 1979 after Intel's quality control rejected them.

Micro move

ITALIAN computer company Olivetti is negotiating to acquire a minority share in US microsystems company Ithaca Intersystems. The deal is expected to be completed next week. The move is seen as a bid by Olivetti to get a foothold in the microcomputer market.

Three more H-series processors soon

by Keith Jones

THIS year could mark the addition of three more IBM processors to the H-series, which began late last year with the 10 million instructions per second 3081. One will be more powerful than the 3081 and the other two will fit in below the first H-series machine.

These are some of the main predictions made in a report published by Strategic Business Services of San Jose, California, which looks at IBM's large and mid-range system strategies.

The report examines aspects of the 3081, their impact on existing 303X plug compatible competitors machines and on IBM's.

It discusses how the "dyadic" processor in the 3081 functions and examines costs of 3081 software which include nearly $3,000 in the US for the most basic maintenance and $7,500 a month for typical licence fees on unbundled software.

SBS sees June as the likely launch time for the H-4, code-named Spruce, with a 14.5 mips dyadic processor, and for first shipments in the second quarter of 1982.

June will also see the introduction of H-2, an eight mips uniprocessor (as opposed to dyadic) code-named Maple.

IBM will be ready to announce the 11-1, code-named Poplar, in September; it will be a slowed-down H-2, and field upgradable to the latter machine.

The report also looks at the impact of the 4300 series on the plug compatible suppliers operating in the mid range, concluding that they are in great difficulties generally.

National Advanced Systems' mid-range machines are described as "badly out of alignment" with 4300 price/performance while Magnuson is considered to have "enormous and continuing" cash requirements, even though it appears to be doing well by concentrating on end-user business in the 370/148 class and above.

Nixdorf is the only plug compatible manufacturer that seems to have recognised the threat introduced by IBM's new software and support strategies, according to the report.

SBS refers to Nixdorf's purchase of the Computer Software Company with its EDOS/VS system, an alternative to IBM's DOS/VSE.

● IBM's Large and Midrange Systems: Latest Tactics and New Strategies. 220 pp. $950. Strategic Business Services Inc, 4320 Stevens Creek Blvd, Suite 215, San Jose, California 95129, USA. Tel: 0101/408/243/8121.

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IPC Electrical-Electronic Press Ltd, Quadrant House, The Quadrant, Sutton, Surrey SM2 5AS. Telex: 8624…

Rory Johnston and Donald Kennett look at some of the latest developments on show at Info 81

Giving new Status to homegrown information retrieval technology

A POWERFUL new means of retrieving information could become widely available using a link between two established retrieval products.

British software retrieval package Status was shown at the Info 81 Exhibition controlling an Image Systems automatic microfiche terminal in a system, already under order for UK research establishments, that should soon be put on the commercial market.

Image Systems demonstrated its terminal, holding 780 fiches in a computer-controlled carousel, connected by dial-up link to a Prime mainframe running Status, the retrieval program developed at Harwell laboratories.

Text retrieved from Status contained frame numbers which drove the microfiche terminal automatically to display a corresponding picture, which could comprise more text, graphics, or even a photograph.

The combined system was developed at the British Non-Ferrous Metals Technical Centre, which may become the marketing organisation. Seven systems are planned already for installation at British Nuclear Fuels to retrieve scientific information.

Image Systems already markets a newspaper cuttings retrieval system employing a local Univac mini. One was installed at the Daily Mirror two years ago but has lain unused because of union disagreement; it is expected to go live on March 1.

Prominent among the few new word processing products to be seen at Info 81 were several different models of conversion kits to turn golfball typewriters into cheap WP input stations.

Since there are similar devices announced recently to convert typewriters into printers, users must wonder why these roundabout methods should be preferred to pure electronic typewriters, but it is felt that as there are so many golfballs in the field already the conversion kit market is large.

Formscan was showing its Chatterbox unit for the first time. It can write mini floppy discs for a wide range of word processors, instead of handing only one, unlike those supplied by individual WP companies.

A set of microswitches is inserted in the typewriter and a floppy disc drive sits alongside, all for £1,650. Different firmware is provided to suit the word processor's formatting and tab conventions.

Dataword showed its established conversion products, together with one from the Dutch firm Transaction Word Systems that is not yet on the market and uses twin tape cassettes.

The shared-resource version of the successful US word processor NBI, known as OASys, was on the Venitek stand.

This comes in two basic versions, with 10 megabytes or 70 megabytes of hard disc and up to six screens on the smaller and 32 on the larger. The screens and operating facilities are the same as on the standalone version.

IBM's new 75 electronic typewriter made its debut. This has either 7,500 or 15,500 characters of RAM, which can hold several whole documents as well as standard phrases.

Also attracting plenty of interest was the Displaywriter low-cost word processor, with its enhanced software providing mathematical functions, global replacement, document merge and form filling. With additional facilities such as column manipulation, this new software is making the Displaywriter look like a complete replacement for the Office System 6.

Now operating under the banner of Exxon Office Systems, Vydec demonstrated a communications link between its screen machines and Qyx electronic typewriters.

IBM's latest electronic typewriter, the 75, can have 15,500 characters of storage, albeit volatile, and boasts illuminated operator messages.

CMG moves into viewdata bureau

VIEWDATA has been chosen as the first in a series of piecemeal additions to Computer Management Group's bureau operation designed to lead eventually to integrated electronic office services.

Bob Fswcett, one of CMG's three founders, said at Info 81 that the viewdata bureau service would begin in July using a Redifon R800/70 running Redifon's Viewdata Plus software.

It would aim at potential users of the Prestel, Bildschirmtext and Viditel public viewdata services in the UK, West Germany and Holland respectively, where CMG markets bureau services based on Burroughs B3800s in Croydon and Amsterdam.

The service was on offer at £5,000 a year for one access port, 750 pages and unlimited time on the machine, with the aim of giving potential public service information providers the opportunity to experiment and prepare a database and allowing potential in-house or closed-user-group users to begin modestly.

These terms would be reviewed at the end of March in the light of response.

Six potential customers had been lined up, including a stockbroker, a bank, a retail chain and a motor manufacturer. Two likely uses were management information retrieval and dealer network servicing.

Dealers might consult a product catalogue on the public service and then transfer to CMG's bureau to place an order and see it confirmed.

Office diary, mailbox, newsreel and sales-prospect follow-up reminder are other applications.

The viewdata service could be the interface to conventional data processing, either on the R800 or via a gateway to the B3800 mainframes or to other external services, public or private, later this year.

The Hewlett-Packard HP3000s which have been installed as front-ends to the Burroughs machines will be used increasingly to carry out the protocol conversions necessary for these kinds of flexible interconnection arrangements.

In a break from addressing the Info 81 conference, Roy Croft, deputy permanent secretary at the DoI (centre), and Sir John Barran, head of viewdata at the General Office of Information, were shown Case's scheme for local and wide area networks by Christine Stou.

Case backs Ethernet

CASE has planted its flag firmly in the Ethernet camp in the battle of standards for local area networks, with its decision to develop a unified data communications scheme called Casenet. The UK firm will be adding a local network to its product range based on the Ethernet specification for a broadcast bus system using coaxial cable, agreed by Xerox, Intel and Digital Equipment.

Case is also planning a transport service providing route selection, access control, and speed, code and protocol conversion. Network control arrangements will cover usage monitoring, fault isolation, and centralised diagnostics.

Interfaces are to be implemented to the Case MSX store-and-forward telex message switch and the Case Viditex electronic mail terminal. Applications software planned includes mailbox and office diary services.

Adler aims to sell 2,500 micros in UK this year

by Brandon Gainester

A FORCEFUL entry into the European market for general purpose microcomputers is being made by the West German Triumph-Adler Group, with a new £2,000 system.

The company's UK computer arm, Adler Business Systems, launching the Alphatronic in London last week, told Computer Weekly that it hopes to sell at least 2,500 in Britain in 1981, representing 65% of the company's projected turnover for the year.

TA's strength lies in its vast network of dealers, more than 60,000 worldwide, which account for as much as 90% of the group's turnover. Through these dealers it hopes to sell 20,000 Alphatronics in Europe in the next 12 months, manufacturing being carried out in Nuremberg in West Germany.

A full Alphatronic system costing £2,345 (excluding VAT) comprises a combined Intel 8085A CPU, keyboard and double floppy disc drive, a free standing 80-character, 24-line visual display unit, and an Adler-built 20 characters per second dot matrix printer. A CPU with a single floppy disc drive is also available, costing £1,550.

Launched side by side with the Alphatronic is a wide range of software packages developed by Microtrend, Tridata Micros and Compuserve, each available on disc from the 50 or so Adler dealers in the UK. The packages include word processing, project planning systems, invoicing, sales ledger, stock records, purchase ledger, payroll, and inter-micro communications. A general data management information retrieval package comes free with each machine.

Software is currently in Basic, with Fortran and Pascal to come.

Apart from already substantial sales in Europe for business applications, the Alphatronic has also met with considerable success on the educational market. In particular 1,000 systems have been ordered in Austria for teaching accounting in secondary schools.

Mike Davies, managing director of Adler Business Systems: Hoping to sell at least 2,500 Alphatronics in the UK this year.

NPL will replace packet net

by Donald Kennett

THE National Physical Laboratory is preparing to replace its pioneering packet switching local network.

The new system will use X25 protocols and provide links to the outside world via British Telecom's PSS packet network. The first phase will be based on a GEC 4085 acting as a central exchange with two 4065s as satellite exchanges.

Expansion of the network, by adding further satellite exchanges, will eventually allow all 30 network service computers and all 200 user terminals on the site to be transferred to the new network.

Microsystems 81 keynote speaker

by Chris Hipwell

KEYNOTE speaker on the first day of the Microsystems 81 Conference, to be held at Wembley Conference Centre from March 11-13, will be Ungermann-Bass vice-president Charles Bass, whose Californian company picked up a prestige order recently from British Telecom for its Net/One local networking system.

The subject of Bass's paper will be local area networks – a merger of computer and communications technologies, with particular reference to the part played by microprocessors.

A series of papers on microprocessors and distributed processing follows the keynote address, including one on special-purpose multi-microprocessor systems from Ian Whitworth of the Royal Military College of Science.

Other Microsystems 81 sessions will be devoted to development systems, software, project management, industrial control and a series of case studies covering microprocessor use in diverse applications like analysing intercranial pressure and digital data handling of unsteady aerodynamic phenomena.

The third day of Microsystems 81 is devoted to personal computing, and three main areas of personal computer usage – business, science and technology, and the professions will be examined in separate lectures. Microcomputers in education will dominate the afternoon session with talks on setting up a school computing department and Computer-Aided Learning – A Practical Proposition.

Besides the conference, leading micro training company ICS will hold three one-day professional development courses on how to get started with microprocessors, Pascal – the language of microsystems, and computer graphics.

For further details of Microsystems 81, please contact The Conference Administrator, IPC Conferences Ltd, Room 1317, Surrey House, Throwley Way, Sutton, Surrey SM1 4QQ or telephone 01-643 8040.

ICL denies US report on poor ME29 performance

ICL has reacted strongly to a story in the February edition of the US computer industry monthly Datamation, which slams ICL's marketing performance with the ME29. It suggests that between 80 and 90% of ME29 shipments are direct 2903/4 replacements and that ICL is writing off inventories full of ME29s as sales to make its cash flow position look better.

Datamation also quoted an unnamed source as saying that ICL was "reluctantly killing the goose that laid the golden egg" by converting its profitable rental base of 2903/4 users to the ME29 before time.

In a written response to the Datamation story ICL said that only 35% of ME29 sales were 2903/4 replacements, although it admitted that another 30% came from other existing ICL customers. The remaining 35% of sales were to completely new customers to ICL and 10% were what ICL called "competitive knockouts".

ICL also strongly denied that it was booking ME29 inventories as sales and refuted the suggestion that it was losing 2903/4 rental revenues.

ICL added that it has sold 750 ME29s since the machine was launched in March 1980 and had installed 300. Shipments were now being made at a rate of 20 a week.

Receiver in at Hallmark

From front page

said HBS's Putney offices, firing the 15 members of staff, Tony Cooke, resurfaced closer to the centre of London with a firm called Hallmark Computers, first registered in mid-1979 as a holding company. Hallmark Computers has Cooke and Wainwright as its directors.

Wainwright says: "Hallmark Holdings has no further interest in computers."

Hallmark Computers shares essential premises in Rochester Row with Complete Word Processors. Cooke anticipates a link at board level with Complete Word Processing, though there is no formal arrangement yet between the two companies.

Cooke intends that the latest version of Hallmark deals solely in AM Jacquard equipment. In answer to creditors who feel that he is profiting from the closure of HBS, Cooke says: "I too have lost money, up to £12,000."

He continued: "I have absolutely no intention of buying back the assets although I would like to buy the name off the receiver."

The hope is also to re-employ four or five of the old members of staff.

Adler aims to sell 2,500 micros in UK this year

by Brandon Gamester

A FORCEFUL entry into the European market for general purpose microcomputers is being made by the West German Triumph-Adler Group, with a new £2,000 system.

The company's UK computer arm, Adler Business Systems, launching the Alphatronic in London last week, told Computer Weekly that it hopes to sell at least 2,500 in Britain in 1981, representing 65% of the company's projected turnover for the year.

TA's strength lies in its vast network of dealers, more than 60,000 worldwide, which account for as much as 90% of the group's turnover. Through these dealers it hopes to sell 20,000 Alphatronics in Europe in the next 12 months, manufacturing being carried out in Nuremberg in West Germany.

A full Alphatronic system costing £2,345 (excluding VAT) comprises a combined Intel 8085A CPU, keyboard and double floppy disc drive, a free standing 80-character, 24-line visual display unit, and an Adler-built 20 characters per second dot matrix printer. A CPU with a single floppy disc drive is also available, costing £1,550.

Launched side by side with the Alphatronic is a wide range of software packages developed by Microtrend, Tridata Micros and Compuserve, each available on disc from the 50 or so Adler dealers in the UK. The packages include word processing, project planning systems, invoicing, sales ledger, stock records, purchase ledger, payroll, and inter-micro communications. A general data management information retrieval package comes free with each machine.

Software is currently in Basic, with Fortran and Pascal to come.

Apart from already substantial sales in Europe for business applications, the Alphatronic has also met with considerable success on the educational market. In particular 1,000 systems have been ordered in Austria for teaching accounting in secondary schools.

Mike Davies, managing director of Adler Business Systems: Hoping to sell at least 2,500 Alphatronics in the UK this year.

NPL will replace packet net

by Donald Kennett

THE National Physical Laboratory is preparing to replace its pioneering packet switching local network.

The new system will use X25 protocols and provide links to the outside world via British Telecom's PSS packet network. The first phase will be based on a GEC 4085 acting as a central exchange with two 4065s as satellite exchanges.

Expansion of the network, by adding further satellite exchanges, will eventually allow all 30 network service computers and all 200 user terminals on the site to be transferred to the new network.

Microsystems 81 keynote speaker

by Chris Hipwell

KEYNOTE speaker on the first day of the Microsystems 81 Conference, to be held at Wembley Conference Centre from March 11-13, will be Ungermann-Bass vice-president Charles Bass, whose Californian company picked up a prestige order recently from British Telecom for its Net/One local networking system.

The subject of Bass's paper will be local area networks – a merger of computer and communication's technologies, with particular reference to the part played by microprocessors.

A series of papers on microprocessors and distributed processing follows the keynote address, including one on special-purpose multi-microprocessor systems from Ian Whiteath of the Royal Military College of Science.

Other Microsystems 81 sessions will be devoted to development systems, software, project management, industrial control and a series of case studies covering microprocessor use in diverse applications like analysing intercranial pressure and digital data handling of unsteady aerodynamic phenomena.

The third day of Microsystems 81 is devoted to personal computing, and three main areas of personal computer usage – business, science and technology, and the professions will be examined in separate lectures. Microcomputers in education will dominate the afternoon session with talks on setting up a school computing department and Computer-Aided Learning – A Practical Proposition.

Besides the conference, leading micro training company ICS will hold three one-day professional development courses on how to get started with microprocessors, Pascal – the language of microsystems, and computer graphics.

For further details of Microsystems 81, please contact The Conference Administrator, IPC Conferences Ltd, Room 1317, Surrey House, Throwley Way, Sutton, Surrey SM1 4QQ or telephone 01-643 8040.

ICL denies US report on poor ME29 performance

ICL has reacted strongly to a story in the February edition of the US computer industry monthly Datamation, which slams ICL's marketing performance with the ME29. It suggests that between 80 and 90% of ME29 shipments are direct 2903/4 replacements and that ICL is writing off inventories full of ME29s as sales to make its cash flow position look better.

Datamation also quoted an unnamed source as saying that ICL was "reluctantly killing the geese that laid the golden egg" by converting its profitable rental base of 2903/4 users to the ME29 before time.

In a written response to the Datamation story ICL said that only 35% of ME29 sales were 2903/4 replacements, although it admitted that another 30% came from other existing ICL customers. The remaining 35% of sales were to completely new customers to ICL and 10% were what ICL called "competitive knockouts".

ICL also strongly denied that it was booking ME29 inventories as sales and refuted the suggestion that it was losing 2903/4 rental revenues.

ICL added that it has sold 750 ME29s since the machine was launched in March 1980 and had installed 300. Shipments were now being made at a rate of 20 a week.

Receiver in at Hallmark

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Wainwright says: "Hallmark Logistics has no further interest in the computers."

Hallmark Computers shares basement premises in Rochester Row with Complete Word Processing. Cooke anticipates a link at board level with Complete Word Processing, though there is no formal arrangement yet between the two companies.

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He continued: "I have absolutely no intention of buying back the assets although I would like to buy the name off the receiver."

The hope is also to re-employ four or five of the old members of staff.

Computers thriving in the Irish climate

ABOUT 2,000 jobs were created in the Republic of Ireland's computer industry last year by the Irish Development Authority, the single body charged with the expansion of the country's industrial base.

They form a significant contribution towards the 35,600 jobs created in all sectors, including about 3,000 in branches of electronics other than computing.

According to the IDA, the country now has an industrial investment rate second only to that of Japan and Japanese companies are currently heading the growth of Ireland's computer industry.

The biggest computer project finalised last year — one of the largest by a Japanese company in the whole of Western Europe — was the £40 million integrated circuit plant in Tallagh, County Dublin which should create 1,000 jobs.

Other companies to set up during 1980 were Beehive, Danak EDB, Regnecentrum, Apple Computer, Sord and National CSS.

According to a US Commerce Department survey, the return on investment of computer hardware and software companies in Ireland is now 29 per cent, largely because of low taxes and high grants for starting up there.

At the end of last year, the latest benefit for new investors came with a uniform 10 per cent corporation tax level which applies until the end of the century.

An IDA spokesman went to some lengths last week to explain that the country is not a low wage economy, although its employment costs are well below the rest of Europe and Japan.

The cost of keeping an executive in Frankfurt for a year is set at £61,000, for instance, £57,000 in Paris and £36,000 in London. His or her cost in Dublin is set at £25,000 per year.

Ireland also has the lowest hourly unit labour costs. In unit measure, Belgium comes out with 100, the US with 64, Japan 47, but Ireland with 41.

French electronic phone books

by Jack Gee

FRANCE'S directorate-general for telecommunications is about to place orders for 250,000 "electronic telephone directory" terminals in readiness for the launching of a pilot scheme in Britanny later this year.

The DGT has chosen Thomson-CSF in partnership with Saint-Gobain-Pont-a-Mousson and Telic, whose partner is Matra.

The French government has opted for this formula of partnerships in order to enhance the market impact of the terminals by linking sales to major existing distribution networks.

The entry of Saint-Gobain appears to be associated with its recently announced tie-up with Italy's Olivetti, which has a sales network well adapted to international sales of the electronic phone books.

Philips' French subsidiary TRT-RTC, which shared a pre-production order of 1,000 terminals in 1979 with Thomson-CSF, Matra and Telic, is consequently absent from the new line-up. The Dutch firm has apparently been considered by the directorate-general as lacking enthusiasm for the French Videotex venture.

Sir Keith's 'blessing'

by Rory Johnston

INDUSTRY Secretary Sir Keith Joseph was in Winchester last week to open Office Technology's new development labs and give his ministerial blessing to a Dol-supported advanced office automation project that looks like giving the NEB's Nexos a good run for its money.

OTL has Dol backing of £635,000 as well another £2 million of funding from its sister company Computer Technology, and aims to launch the first model of its office system, limited to word processing, by the end of the year. The company aims to provide "principal support" — that is, automation for managers, professionals, administrative staff, and other originators of documents rather than for typists.

The firm plans to open a purpose-built HQ building in Winchester early next year.

● *Sir Keith is pictured opening the OTL facilities in Winchester watched by managing director Syd Taylor.*

Ministe... in talks ... Japanes... link-u...

by Keith Jones

MINISTER of Informa... nology, Kenneth Baker... what the Department ... calls "an initial visit" ... April to discuss possi... co-operation with the ... computers and ... cations.

Reports suggesting ... would centre on the ... of fifth generation ... described as "greatly ... by Rene Atkinson, head ... partment of Industry's ... tion Technology Divisio...

Atkinson said UK ... companies were aware of ... nese fifth generation p... none had yet made any ... ing to cooperate.

The Japanese Ministry ... and Industry, MITI, is ... international effort on fi... tion computers, one ... reason being the limited ... available from the Japa... ernment. The body is ... to do the research pro... the Fifth Generation C... Survey and Research C... will receive only abo... from government ... year.

Swansea leads with repair syste...

by Keith Jones

LOCAL authorities looking for a low-cost system to manage housing repairs could follow the lead of Swansea City Council which has just rejected a £70,000 ICL package based on the MB 29 in favour of the Dacoll Democrat multi-screen microprocessor system.

Costing £36,000, the Democrat is supplied by Business Micro Systems Ltd of Harrogate which has written housing repair software to meet Swansea's specification.

Swansea's data processing manager Mike Collins believes that the software could be used by at least 20 other local authorities.

For helping with the specifications, Swansea will receive a royalty from BMSL on every additional Democrat sale in this application area.

Collins described the Democrat as one of the few microcomputers he knew of that could ... mainframe competitor ... megabytes of Winchest... rage and multiple screen...

Swansea will start w... mocrats and increase ... 11, which will be used ... and update 20,000 hou... files held on the Wan... storage.

They will also provide ... housing information on ... ICL 2972 and 2960 ...

The Times moves towards 'direct inpu...

by Rory Johnston

COMPUTER typesetting equipment for The Times is to be installed in the Times for three years will be brought into use at last following agreement between purchaser Rupert Murdoch, and the printing unions.

Supplied by SDC in California, the system will not be used as it was designed, with journalists operating the keyboards.

Redundancies of 50 per cent have been accepted by the National Graphical Association, brought about by the higher throughput of the equipment and amalgamation of The Times and Sunday Times composing rooms.

Direct input by journalists, to which The Times management was committed, is not mentioned in the agreement but there are signs that NGA staff are reconciled to conceding this eventually.

There are still problems whether journalists will ... access to screens for ... overall agreement is ... that reached with the ... management is less ...

This was going to be ... mented first on The Times ... ments, but since the ... these is moving out of ... plans will have to be ...

The switch to new ... should take six months ...

NEWS BRIEF

Jobs for disabled

DISABLED people in the UK are being encouraged into microelectronics in an attempt to overcome future shortages of skilled personnel. A working party has been set up by companies which have joined the Muscular Dystrophy Group of Great Britain to investigate the problems and publish guidelines both for the disabled and the industry.

Police system

IBM and the Irish government have signed a £200,000 leasing agreement to supply the Irish police service with a 4300 computer system which will store information on stolen and suspect vehicles, firearms licences, missing persons and vehicle registration as its first task.

Postcoding

AT LEAST 70% of all mail must be postcoded if the computerised sorting system is to pay its way, a Post Office spokesman has admitted, after Midland householders noticed some of their mail arriving with blue-dotted envelopes. The Post Office has used an invisible mail code for some time, but management decided to incorporate a visible reminder. Only 49 per cent of the UK mail is postcoded at present.

DEC services

MARKETING, planning and support services for Digital Equipment's 36-bit time sharing machines, the DECsystem 10 and 20, will be provided in future by a new large computer group which will assume functions handled formerly by the various market-oriented groups within DEC.

Schools discount

SCHOOLS and colleges are offered discounts of about 25% on Onyx C8000 series micros from Thame Systems of Thame in Oxfordshire, until the end of March. Made by Onyx in San Jose, California, the range starts at £6,500 for a system based on the Zilog Z80A eight-bit processor with a 10-megabyte Winchester disc drive and block-reading cartridge tape back-up.

Japanese imports

IMPORTS of Japanese office and computer equipment accounted for £74 million of the £1,113 million total of goods imported from Japan by the UK in the first 11 months of 1980. The figures from the Anglo-Japanese Economic Institute show that road vehicles still accounted for the lion's share of imports at £459 million.

Paperless info

A £25 MANUAL has been published by the Simplification of International Trade Procedures Board (SITPRO). Computers and International Trade Documents is intended to help exporters seeking to automate their documentation and it has the "end goal of a paperless information transfer".

Centronics sues

CENTRONICS in the US is suing Integral Data, a competitor in the low end of the matrix printer market, in an attempt to prevent Integral from employing two former Centronics engineers for at least a year. Centronics alleges that they are conspiring with Integral to use Centronics trade secrets.

Supercentre

CONTROL DATA is enhancing the supercomputer processing facilities on its Cybernet network by adding two Cyber 205 machines to the existing Cyber 203 at its Minneapolis "supercentre".

Private system links to Prestel on for next year

by Doosid Kenuett

BRITISH TELECOM has committed itself to providing a gateway from Prestel to third-party databases and computer services by March next year.

Software for the gateway was bought from the West German Bundespost late last year after it had been developed for the Prestel-based Bildschirmtext public viewdata service by Systems Designers Limited under contract to Aregon International.

It is now in use in trials in Berlin and Dusseldorf, each of which has 2,000 users. Ten mainframe computers — including IBM 370 and 4300, Siemens and Univac machines — are currently accessible from Bildschirmtext via the gateway system and 20 more are due to be linked up this year.

Further extensions and improvements to the gateway software were ordered by the Bundespost last week, under a contract which Aregon International's managing director, Anthony Chandor, said was worth a five-figure sum.

Current service providers include mail order companies, a holiday company and a bank. Four more banks plan to offer services to account holders, including Deutsche Bank, one of the biggest banks in the world, which last week announced that its service called Dialog would start up in the middle of this year.

Verbraucherbank, a small and innovative bank which was an early user of cash dispensers, has already set the pace by making Bildschirmtext-based services available to all its customers. They can make transfers from their accounts, ask for statements and loans and start or stop standing orders.

UK banks are believed to be interested in providing similar services based on the Prestel gateway. Other likely users of the facility are travel agents, airlines, retail and wholesale chains and other companies which need to shift information to or from a network of branches or dealers.

Availability of the gateway facility on Prestel is to start in London and spread through the UK during 1982. Links to Prestel centres from private computers will use British Telecom's PSS packet network where appropriate and will integrate with the Prestel Advanced Network and Database Architecture, Panda, as it is implemented between next year and 1984.

Potential users of the gateway are advised to start preparing now if they want to be ready for the opening date, and SDL and British Telecom are running a one-day conference in London on March 18, to start their user support programme.

Prestel gateways to private computers emble public viewdata services to be used for banking, booking and shopping.

Ops halt French statistics

by Jack Gee

THE French National Statistical Institute's headquarters at Nantes, on the Atlantic coast, has been paralysed for over a month by 40 terminal operators who refuse to resume work until they are given a ten-minute hourly break.

The operators, all young women in their early twenties, work at a centre which feeds vital information to France's most important data banks. These include Sirene (which lists business firms), the National Register of Voters, RIPP (which contains the national census findings and handles social security and pensioners' files), and SAF (which pools confidential Ministry of Interior information).

The operators, of whom only four belong to trade unions, say their work was tolerable last year while they were key punching data in batch mode. But the girls claim life became unbearable for them when Nixdorf minicomputers were introduced in November with interactive display screens.

A 24-year-old mother said: "We type between 700 and 1,000 pages a day. Of course, when I am tired and the letters begin to dance in front of my eyes, I can always stop the conversation by turning a key. But then the interruption is recorded and I risk losing my productivity bonus".

£2m Drax order for Babcock

CONTRACTS worth over £2 million have gone to Babcock Bristol, a member of the Babcock Industrial and Electrical Products group, for the supply and installation of control equipment at the Central Electricity Generating Board's Drax power station.

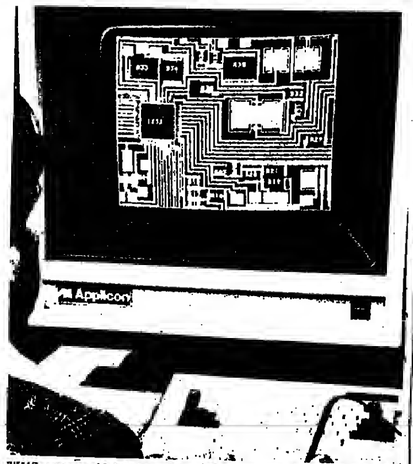
The equipment is for direct digital control and sequence control of three boiler units.

Staff agency

A COMPUTER staff agency and consultancy has been set up by ex-employee of ICL, Vic Rumney. Called NES Computer Services, the new company is based in Altrincham and will supply analysts, programmers, operators and operating systems specialists to users of computers.

Texas enters the gate array market with Schottky logic

by Eileen Sta



THIS computer aided design and manufacturing system for hybrid design has been introduced by Applicon UK of Stockport. Called the Video Hybrid System, the interactive graphics system it claimed to increase productivity ten times over. VHS has the ability to extract from the design layout all the checking, documentation and manufacturing outputs required for hybrid production. It can be used in integrated circuit and printed circuit board design.

TEXAS Instruments has moved into the gate array market with two initial devices, a 400 and an 800 array, using Schottky transistor logic (STL) technology. A new division has been set up within the company to cope with research and development.

Gate arrays are just part of the programmmable semi-custom integrated circuit market, which is predicted to be worth $20 billion worldwide by the late 1980s. In 1979 it was worth $2 billion.

As a fraction of the worldwide semiconductor market, programmable devices will represent about 45 per cent by the late Eighties.

Although companies like IBM in the US and Ferranti in the UK have been in the array business for a few years, TI considers the Japanese companies its main rivals. IBM develops its semiconductor technology for in-house use and Ferranti is not automated enough to be considered serious competition.

TI believes that the key to its success in the gate array market is its design automation capabilities, which have been developed over 12 years. Future plans are to link design terminals in Bedford with a main computer in Dallas, Texas.

UK ventures

In the UK, two gate array ventures have been announced over the last six months. One was between Rneal Microelectrunic Systems (RMS) and General Instrumcnt Microelectronics; the other from Marconi Elcctronic Devices (MEDL), the semiconduetor braneh of GEC.

MEDL has acquired an oxide isolated silicon gate CMOS technology called ISOCMOS from Canadian telecoms manufacturer Mitel, with which it has had no experience of volume production. RMS and GIM are developing their own version of this technology, which is claimed by them to have the highest performance of those available today.

TI is branching out on its own, choosing STL as its gate array technology, although a form of CMOS will be considered in the company's future plans. STL is slightly faster than CMOS, but uses more power. TI has the benefit of a great deal of experience with Schottky TTL technology especially in volume production.

Desirable qualities in the choice of technology were high speed, low power consumption and room for scaling down. According to the graph of the speed-power product (SPP) the nearer n technology is to the axis, the better.

Both CMOS and STL can be scaled down to geometries near the one micron level. TI is now using five microns but expects to move to three using STL by the end of this year and one by 1985. At five microns using STL a typical gate delay is 2-2½ nanoseconds and typical power consumption is 300 microWatts. Using CMOS at five microns, gate delay is typically six nanoseconds and power consumption 90 microWatts.

Advanced STL

At one micron, gate delay is typically 0.25 and 0.45 nanoseconds and power consumption is typically 130 microWatts for STL and 35 microWatts for CMOS. As geometries decrease, so does the speed/power product and so the performance of the gate arrays increases.

By scaling down to one micron geometries, TI hopes to produce a 10,000 gate array in advanced STL by 1985. Before this will come 1,000, 2,000, 4,000 and 5,000 gate arrays. According to TI, applications will increase with the capacity of the gate arrays.

At the moment, TI sees its gate arrays as being particularly useful in the minicomputer, robotics, terminal and disc drive markets. They will also be applicable in all markets that previously used TTL technology.

After the 10,000 gate array device, TI plans to incorporate analogue functions onto chip. This may also extend to incorporating on-board ROM. As the chip contents increase, however, there is a need for a different method of packaging, such as a chip carrier or a space array. TI has already plans for this.

The first two devices TAT004 and the TAT00 former has 540 gates or eight ment groups (ABGs) of 400 are useable gates. gates form 30 internal cells by 6 format with 140 layout.

Customise

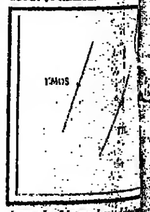
TI produces the gate array 140 channels of layout in volume quantities and then interconnecting channels nected in such a way as to isc the chip for the customer.

This last task is done the aid of a computer. The cycle is reduced from nine months to four or six this dramatically reduces of the circuit.

TI is charging two separ for its gate array service recurring cost and a volume duction cost. The former the design-to-prototype can be anywhere between and $40,000. This should to $12-15,000 by 1985.

The production cost for 5,000 and 10,000 units per part. By 1985, this down to $12 to $20 per TAT004 or TAT008 and $45 for a higher capacity

These costs may seem a full custom cost for array chip would about $1 million.



A graph of internal gate delay (vertical axis) versus power, showing the performance of CMOS and STL technology over the five year period from 1981 to 1985, as geometries reduce from three to one micron.

CMOS technolog from Lockheed

A 900 gate CMOS-on-sapphire gate array is being developed by Lockheed Microelectronics Centre in California and will be ready for evaluation and testing at the end of this quarter. IBM announced a 5,000 gate array chip last year using bipolar Schottky TTL technology.

Designed at four micron dimensions, the chip is claimed to be capable of clock rates of 30MHz with propagation delay per gate specified at less than two nanoseconds. Power consumption is claimed to be less than 50 microWatts per gate at 1MHz operation.

The first two products to use the array will be an eight by eight bit multiplier and a square rooter which are being developed in-house for a space application.

Meanwhile, Lockheed is also developing a higher density two micron CMOS process that will produce gates per chip.

Using bipolar technology has achieved a power of 460 microWatts per gate actual measured gate delay nanoseconds.

In the UK, gate arrays developed by two companies being a silicon gate nology which is said by panies involved to be the technology of the future.

Racal Microelectronics and General Instrument Microelectronics are planning array for 1982 and a 3,000 array for 1983, operating at 15MHz. Marconi Electronic vices, part of GEC, a 2,000 gate array using acquired ISOCMOS Canadian telecoms firm Mitel.

Superbrain acts as teletype termin

A SOFTWARE package which allows the Superbrain microcomputer to act as a teletype terminal and communicate with time sharing software systems is now available. Called TTY, the package permits the transfer of files to and from other compu- ters, and allows the user to operate in CP/M while still in Level II. The package is available from DBC, Glasgow, at £150.

SOFTWARE FILE

by Claire Good

Financial modelling on a microcomputer is now possible with a new program called Micromodeller, which has been developed by Intelligence and will be distributed in the UK exclusively by ACT Microsoft. Micromodeller costs £425 and can run on a £2,000-£4,000 worth of Apple II. A comparable mainframe software package would cost about £18,000.

Cincom breaks new ground with development system

PROGRAMMER productivity is the aim of Cincom's new application system, Series 80 Mantis, launched last month in the US.

The system is Cincom's latest move away, from dependence on its main money-spinner, the database Total, and towards application-oriented tools, such as TIS and MRPS.

Series 80 Mantis premises "complete beginning to end online application development, without the need for batch processes". Hefty time-saving is quoted for programs produced using Mantis: five hours to complete development, where the same program took 24 hours using IBM's DMS programming aid, and 80 hours using "conventional Cobol programming techniques."

Terry Booth, Cincom's UK manager, believes that the product will be bigger than Total for his firm. "It started as an in-house tool, and Cincom in the US has been using it for over two years," he told Computer Weekly.

"It's hitting the market at exactly the right time; everyone's looking for productivity, and we're getting an incredible reaction to the product. Twenty-five were sold within eight days of its release in the US – not just to established Cincom customers, either, as it really is a standalone product."

Although the official UK release date is not until April 1, there is already a control site in the UK, and Booth says there has been a great deal of interest in the product.

Mantis is said to bring programmer and end-user closer together, with the emphasis on the design specification phases. The programmer can provide what Cincom describes as "a working model which can be modified to meet changing requirements." The code used on the model is actually an executable high-level language, said to need no more conversion once the user has approved it.

Mixture

The language is a mixture of various features borrowed from Basic, PL/1, Pascal, and APL. Cobol, seen by Cincom's president Tom Nies as "archaic", was firmly excluded. The entire tool took over two years to develop.

Using Mantis, a programmer can implement an application interactively in one sitting, says Cincom, stressing that the system should not be seen as a program generator or design tool, but as a complete development tool.

Mantis can be used to screen and files, write programs, test and debug applications, as well as doing other tasks such as system up and running. It has been used in system conversion, and is said to be transportable between operating systems and monitors.

The system works with VOS, CICS, and Cincom's own monitor Environ/I. It costs about 200K-bytes of main memory, and US prices give a guide to likely cost, at $20,000 for a single user licence (up to eight CRT terminals) and $500 a month.

RMF figures 'err'

A REPORT from the US suggests that IBM's Resource Management Facility, part of MVS, may be out as much as 126 per cent in its estimation of exactly how CPU is used.

The study, undertaken at Occidental System Inc over a 17-month period, found that while RMF was accurate in its overall estimate of CPU use, its regional estimates are on average 22 per cent below in batch mode, 126 per cent under in TSO, and 25 per cent under in IMS.

If the results hold water – and similar studies by Amdahl also point out discrepancies in RMF estimates – then they suggest that MVS users are not able to estimate system upgrades accurately on the basis of information from RMF, although IBM in the US has said that it is not aware of any inaccuracies.

FINAPL flies high with two marketing deals

FINANCIAL planning system FINAPL has landed two major marketing agreements, one with ICL Datskill and the other with US firm STSC, parent of the worldwide APL time sharing service APL*PLUS based in Bethesda, Maryland.

FINAPL was developed in APL by the Mancheater firm FARS Computer Services. FARS has been marketing the system for some time on Digital Equipment, Harris and IBM machines.

The Datskill agreement will make the system available to APL users with ICL 2900s running under VME/B. It is the first time ICL has APL products and it is likely that the joint agreement with FARS will lead to other APL ventures.

FINAPL complements the Prosper Stat planning and modelling system already available to non-APL 2900 users.

FINAPL also slots neatly into the APL*PLUS range and Michael Hardwidge, managing director of the London branch, described it as "an important addition to STSC's library of APL products."

The STSC agreement is significant in giving FINAPL an international market in the world-wide telecommunications network, and for the choice of British software by a company which can take its pick of APL products.

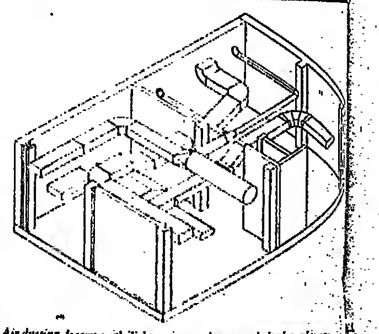
Geoff Kemmish of FARS, the man who wrote FINAPL, does not see the two contracts as a personal triumph but as proof of APL's commercial potential.

"From our point of view, it's good to find others to back the view we took long ago, that there is a market for APL packages and that there's no need to re-invent the wheel with every application."

FINAPL is available already to users of the I. P. Sharp APL Service and the GSI time sharing bureau. For ICL machines it will cost £12,000.

Package range for Level 6

A RANGE of packages for the Honeywell Level 6 Model 200 computers has been developed by MBS Data Systems. Included is a suite of programs for sales, purchase and nominal ledger, sales order processing, stock control and payroll.



Air ducting drawn with Tektronix graphics may help draughtsmen.

Helping with donkey work

IF you thought that the obvious person to produce diagrams of air-ducts and ventilation in a building was a draughtsman, then you're wrong. The picture above was produced by a Prime computer, using Tektronix high resolution graphics, and a system called Compass.

Compass has been developed over the last couple of years by the Computer-Aided Design Centre at Cambridge, and the user, air-duct manufacturer Henry Hargreaves. It aims to help draughtsmen rather than put them out of work, by enabling them to concentrate on layout, rather than spend time drawing details.

The system helps in the design and layout of components, as well as generating scheduling instructions for the shop floor.

It also creates information and engineering documentation from a 3D model, which is built up on the keyboard using [illegible] design details.

COMPANY NEWS

by Kevin Cahill

Siemens results fall £10m

SIEMENS, the German electrical giant with more than half its turnover now concentrated in electronic components, communications and data processing systems, reports a fall in profit of almost £10 million, from £136 million in 1979 to £126 million in 1980. Turnover rose marginally from £6.3 billion in 1979 to £6.44 billion in 1980.

The company blames a sharp fall in the price of general purpose computers in the medium performance range for the losses mentioned in the data processing division.

The company had 1980 sales of £360 million in the DP division, £1.82 billion in the communications division and £300 million in the components division. No profit figures are shown for the individual divisions.

The German computer market, estimated to be the second biggest in Europe, is Siemens' home territory and the downturn in the German economy seems to have caught Siemens by surprise.

The outlook for the coming months is not promising, according to the company's new chairman, Dr K. H. Kaske.

The company, in its report, blames the fall in the Deutschmark for some of its problems.

This sort of comment would seem to contradict the universal moan of UK companies that the strong pound has caused them to lose international competitiveness. However, the explanation lies in the volume of foreign purchases involved in a company's sales and manufacturing mix. In the case of Siemens the relative cost of the Fujitsu M200 which Siemens markets as the top end of its 7000 range would have risen by upwards of 25% as the value of the Deutschmark has declined relative to the yen.

However, the cheapening of the DM should have a beneficial long-term effect for Siemens, though the company itself displays no optimism about either the domestic or international scene in the short term.

Threefold increase a boost for Olivetti

DE BENEDETTI: "We think the big revolution is coming in the white collar system."

OLIVETTI SpA in which giant French company St Gobain recently took a 20% stake to complement its 50% holding in CII Honeywell Bull, has announced tripled profits for fiscal year 1980, from £16 million in 1979 to a current £47.5 million. Turnover rose to £952 million, a 19% rise on the previous year.

The company made a £38 million loss in 1978, but debt has fallen to £332 million and Olivetti is planning an £80 million share and bond issue later this year.

Olivetti also plans to increase the 4.3p dividend it paid to Italian shareholders last year, the first such payment since 1974.

Olivetti failed to make the breakeven level it predicted for 1980 in the United States, turning in instead a loss of £8.6 million, but is aiming for 20% of the electric typewriter market this year. To achieve this objective, Olivetti revealed that negotiations with a US company had reached a delicate stage.

There are hints that the negotiations would probably lead either to purchase or possibly a marketing agreement with a high technology partner.

The company is looking for a profit of about £2 million in the US this year.

In an interview, Carlo de Benedetti, who bought 20% of Olivetti in 1978 and took over as chief executive officer that year, revealed that Olivetti is in the midst of reappraising its entire product line.

De Benedetti explained that the company was streamlining its hardware by standardising basic products particularly at the lowest end of the range.

This would not interrupt product compatibility and the new machines scheduled to appear towards the end of this year could be integrated fully with existing products.

Commenting further on Olivetti changes, de Benedetti said: "Until now, productivity has been seen as a blue collar problem but we think the big revolution is coming in the white collar system.

"This change will mean more investment, which is the economic basis of the office of the future."

In a surprising footnote to his comments, De Benedetti claimed that Olivetti had a marketing capability second only to IBM and hoped that this would enable it to play a large part in selling the office of the future.

In terms of DP turnover, Olivetti is about one-tenth the size of IBM and ranks lower than tenth in the world league of coroputer companies.

Outlook is bleak

THE economic gypsies, complete with their computer driven crystal balls, are beginning to appear in great numbers with deeply divided views of what they think will happen to the British economy over the next year.

The average view is that inflation will be hovering around the 9 to 10% mark at the end of the year.

Manufacturing output, generally considered a key indicator of the economic health of the nation, is almost universally predicted to continue in decline well into 1982.

Unemployment is generally predicted in the 2.5 million to 2.75 million range for the autumn. This now looks optimistic and is probably out of line with the 4.5% further decline predicted for the manufacturing sector.

Computer Weekly will shortly print its own summary of company reports and predictions for 1981/82, bearing in mind that many computer companies continue to foresee growth in the industry.

Commodore soars to new peak

COMMODORE International has announced record increases in turnover and profits for the last six months of 1980.

Turnover was £80 million, against £56 million in the same period of 1979. Profit for the second half of 1980 was £13.1 million, against £7.7 million for the last six months of 1979.

Irving Gould, chairman, attributed the improvement to strong sales of the company's micro systems to the business and educational sectors, and strong sales of Commodore semiconductors to outside customers.

Gould said current business continued at an excellent rate with the current (unreported) quarter's sales expected to be well ahead of last year, and a further improvement on the period just reported.

The company expected to see a contribution from the VIC 20 personal computer just released.

Cetec buys US systems supplier

CETEC Corp has disposed of its broadcast transmitter business and bought Automated Business Concepts, the San Diego specialist business system supplier.

The company would not reveal how much it paid for ABC but indicated that the deal was based on a mix of cash and Cetec shares.

Cetec president Robert Nelson, said that the company was retiring from a mature market to get into a business with growth prospects.

Nelson described Automated Business Concepts as a specialist supplier of customised systems to the 8,900 AM and FM radio stations in the US.

He noted that every AM and FM station had a radio transmitter, but less than 5% had automated systems to handle internal billing and accounting needs.

Nelson expected that the acquisition would complement Cetec's existing computerised programme scheduling business, which the corporation markets currently through its CBG division in Carpenteria, California.

Cetec has installed over 1,000 of the programme scheduling systems in the US and expects Automated Business Concepts to improve turnover in this area by as much as £.5 million in the first year.

CW SHARES TABLE

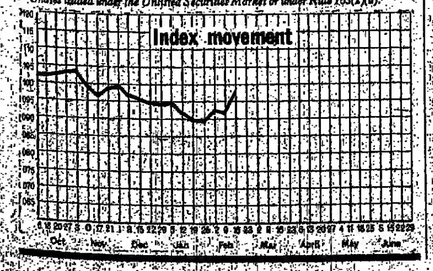
Dated 18/2/81 — Index 96.66 Change +0.66

Prices 1981 High	Prices 1981 Low	London Stock Exchange Stock	Price	Chge
152	115	A Carrie Tech (25p)	150	+ 4
222	162	ICC Int (50p)	170	
22	20½	B Bon Tanni (25p)	20½	
88	66	Chubb (50p)	82	+ 4
52	36	Cole (H.R.) (10p)	47	+ 1
82	62	De La Rue (50p)	80½	+ ½
182	178	Ladd (10p)	178	
128	123	Racal (50p)	123	
865	645	SEC (25p)	861	+21
82	62	Thorn (25p)	82	+ 1
78	58	Calculators (10p)	61	
277	210	Micro int (10p)	270	+ 5
110	80	Sinclair (10p)	110	+ 5
58	38	Other & Elect (25p)	55	+ 1
2550	2000	Philips Lamps (R100	2550	+10
2550	2000	Racal (50p)	2550	+10
2550	2000	Reed Int (50p)	2550	+10
2550	2000	Redifusion (25p)	117	+ 1
2550	2000	Thorn-EMI (25p)	396	+ 6
		OTHER MARKETS*		
1000	770	WWW (£1)	780	+10
1000	770	Barlow Axia (10p)	780	
1000	770	Bolts & Nuts (10p)	780	
1000	770	Steen&Hro (10p)	780	
		US Stocks		
3150	2815	Amdahl	2815	
2550	2175	Apple Inc	2175	- 25
2550	2175	Auto Data Pro	2175	
2550	2175	Burroughs	2175	
2550	2175	Computer Sciences	2175	
1900	1650	Comp Automation	1650	

Prices 1981 High	Prices 1981 Low	US Stocks Stock	Price	Chge
1650	1510	Comp Sciences	1650	- 2½
1650	1510	Computer	1650	
1650	1510	Control Data	1650	- ½
1650	1510	Cray Research	1650	
1650	1510	Data General	1650	- ½
1650	1510	Datapoint	1650	
1650	1510	Digital Equipment	1650	- ½
1650	1510	Floating Point	1650	
1650	1510	Gen Automation	1650	
1650	1510	Gen Electric	1650	
1650	1510	Hewlett-Packard	1650	- ½
1650	1510	Honeywell	1650	
1650	1510	IBM	1650	- ½
1650	1510	Intel	1650	
1650	1510	Interdata (MDS (Modcomp Data)	1650	
1650	1510	Lockheed Comp	1650	
1650	1510	Memorex	1650	
1650	1510	Modular Comp	1650	- ½
1650	1510	Motorola Semi	1650	
1650	1510	NCR	1650	
1650	1510	Norsk-Data	1650	- ½
1650	1510	Prime	1650	
1650	1510	Raytheon	1650	
1650	1510	Sperry Univac	1650	- ½
1650	1510	Storage Tech	1650	
1650	1510	Tandem	1650	
1650	1510	Texas Instruments	1650	
1650	1510	Wang	1650	
1650	1510	Xerox Data Sys	1650	
1650	1510	Zilog	1650	

The table shows the closing prices in London on Friday and in America on Thursday. The share index is based on the prices of the UK companies in the table. Highs and Lows have been adjusted where necessary.

** Shares traded under the Unlisted Securities Market or under Rule 163(2)(a).*



Nixdorf recruits 2,500 workers

NIXDORF, the German-based supplier of computer systems has announced a turnover increase of 25% in 1980. Unaudited turnover for the year was £912 million and the company has taken on 2,300 new workers to cope with continuing expansion.

The Nixdorf workforce now totals 13,700.

The company is maintaining last year's 16% dividend but has not revealed the profit figures.

Prime profit up 84%

PRIME Computers has announced figures for the year ended December 31. Turnover leapt 75%, from £66 million in 1979 to £116.3 million in 1980, and profit was up 84%, from £7.3 million in 1979 to £13.57 million in 1980.

The profit figures include a non-recurring UK tax credit of just over £500,000. Excluding that, credit profits rose 98%.

Sales for the final quarter of 1980 were £37 million and if that trend continues into 1981 the company could will achieve turnover of around £150 million.

Commenting on the outlook for 1981, Prime president Kenneth G. Fisher said, "Our order activity remains strong in the face of uncertain economic conditions. While we are preparing to address changing circumstances, our outlook is for another year of vigorous growth."

Honeywell snaps up Plantronics subsidiary

HONEYWELL Inc has formally revealed the acquisition of the whole of Action Communications Systems Inc from San Jose-based Plantronics for about $6 million.

Action Communications Systems specialises in the supply of large telephone network management systems and represents a further deepening of Honeywell's commitment to selected purchases which will enhance its data and communications products.

Plantronics said the disposal of ACSI would enable it to concentrate on its telephone supply business and to provide cash for further development in automatic testing systems.

Plantronics also revealed that it was discontinuing its Centra Vox office answering equipment line because of "advancing age". This will cost Plantronics about £700,000 in write-offs this year.

Informatics rise

INFORMATICS, the Los Angeles-based information processing software and consultancy company, announced a 12% increase in turnover for the year ended December 31, to £54.6 million, against 1979 sales of £48.8 million. Profit was up 49% before tax, from £2.2 million to £3.3 million.

Flying Tandem

TANDEM, makers of the non-stop multiple processor, announces first quarter results for fiscal year 1980/81 up 116% on 12 months ago. Profit for the quarter was £2.2 million, against £939,000 in the same quarter of 1979.

Turnover was increased by 95% to £17.6 million from £9.05 million for the equivalent quarter in 1979.

MICHIE'S PRIVATEVIEW

The Black Death of our times (2) — re-skilling the works

Professor Michie continues his analysis of the "Black Death of our times"

SEVERAL years ago, in an initiative towards restoring to the task of assembling automobiles some of the lost interest and dignity of work, Volvo tried an experiment in which the work-force was divided into teams, each of which assembled entire cars one at a time. Economically it proved to be marginal. But a case may one day exist for re-opening the question as the basis of a new move in computer-based robotics.

I refer to the possibility of developing programs for sensing and control, smart enough to enable robots to act as co-operative members of such teams as those of Volvo's experiment.

Gains

Programming methods of the required kind are quite general. Energetically developed they could in some cases enable the craftsman to retain and extend his skill while increasing his productivity. A home bicycle-maker under present conditions assembles for sale ten machines per day. If investment in a suitably capable seeing and self-trainable device enabled him to raise output to 30 per day, economic gains could obviously accrue, but also something more. Supervision of a new kind of teachable assistant would enlarge the scope and versatility of his aspirations, while still permitting him m work from home.

The general argument draws support from two considerations:

1. As Joseph Engelberger of Unimation among others has pointed out, experience has shown that the job of minding even today's blind and stupid robots is coveted on the shop floor and confers added status.
2. The trend of componeht costs for robots and associated microelectronic gear indicates a favourable balance of profitability.

A worrying corollary of the second consideration is that enrichment of jobs will presumably be accompanied by a reduction in their oumber. The only apparent alternative is reduction o hours worked per employed person.

Startiog from a level of 60 to 70 hours per week, reduction of working hours has been urged by the trade unions throughout industrial history and resisted every inch of the way by the employers and managers.

Rather than dismiss this resistance as blind capitalist greed, we should acknowledge that managers are managers and have their reasons. These reasons can be seen operating alike to bolster working hours in Socialist economies, which absorb the displaced labour into token jobs, and in capitalist economies which absorb it on to the dole. The reasons have to do with the competitive position of an enterprise or consortium relative to its foreign counterpart. They derive their force from the simple arithmetic which relates a resource's yield to its maintenance cost (including rental, amortisation, etc).

A factory worker is a resource costing full maintenance for 168 hours of each week, round the year. His yield can be calculated by multiplying the number of working hours by his productivity per hour. The latter is largely determined by the degree and form of automation.

More wealth

It would appear then that some improved form of automation, let us say intelligent robots, conferring a 30 per cent increase of productivity could be accompanied by a 15 per cent shortening of working hours and still come out ahead (1.30 x .85 = 1.10, a 10% gain in production). The worker gets paid the same for less work. But he produces more wealth. Apparently everybody makes a bit.

Not so, says the manager, showing the scars of past export campaigns. What if the West Germans meanwhile iotroduce ideotieal automation, but only reduce the work-week by five per cent, or not at all? It is easy to point out that West Germany Ltd is not particularly helped as a whole, since the additional unemployment has to be subsidised out of taxes. But this consideration lies outside the terms of competition between the individual German company or consortium and its British opposite number.

Compromise

Acting and choosing withio this oarrow frame, whichever has the tougher-minded management will be the one that unloads at the lower price on the world market.

Some flexible compromise between stiff import tariffs and the present downward slide to the scrap-heap must surely be possible. A friend who combines scientific distinction with impressive practical experience suggested in conversation a two-tier currency. An adjustable proportion of all State-financed wages, salaries and benefits would be paid in domestic coin, good for buying a Mini-Metro but not a Toyota. Some mark-up of the remuneration paid in funny money would have to be permitted. But there is the germ of something here.

There may also be the germ of something in the re-skilling potential of self-trainable multi-purpose robots.

Donald Michie

Donald Michie is Professor of Machine Intelligence in the University of Edinburgh.

14 YEARS AGO

From Computer Weekly of February 16, 1967 (this column temporarily replaces our Ten Years Ago feature, due to the postal strike in February and March, 1971, which resulted in the suspension of Computer Weekly distribution):

RUSSIAN Premier Mr Kosygin visited Elliott Automation's Borehamwood plant last week to see some of the UK's latest automation equipment. He was accompanied by the Minister of Technology, Anthony Wedgwood Benn . . . . . More power has been brought to ICT's 1900 computers by the introduction of eight new central processors. Known as the E and F range, they apply to the 1904 to 1907 models . . . . . Two general purpose computers, the first to be used for newspaper production, are to be supplied by ICT. The machines are 1901s and will be installed at Portsmouth and Luton . . . . . When the problem of computing time and capacity available to London University's Institute of Computing Science was raised in the Commons last week, it was stated that no more government money would be made available to enable the Institute to have more time on the Atlas . . . . . A Department of Computer Sciences has been formed at Strathclyde University . . . . . The chairman of the Computer Board for Universities and Research Councils, Professor B. H. Flowers, is to succeed Sir Harry Melville as the next chairman of the Science Research Council.

FOCUS

Safeguarding your software

WHILE it may currently be all quiet on the mainframe front, the software world is having a far from peaceful time. The general interest being produced by the definitive software generator package, The Last One, is being balanced by concern over software liability, copyright and legal protection against sundry pirates.

In fact at first sight next month's conference in London being staged by Gower, "Computer Software Protection — Killing the Pirates!" should receive the blessings of all DPMs who are suffering from the over-indulgent claims of keen software salesmen.

This, however, is not the case — the protection involved being that of the piracy of software packages which apparently is a fast growing activity, inexcusingly affecting the software industry.

Open market

While many DPMs would be only too happy if someone would come along and remove certain areas of their software library, even to the extent of making bonus offers of some old mag tape or tape splices as encouragement, the retailers of packages are not so enthusiastic. Much time, effort and cost resources are involved in developing and marketing software packages and reimbursement can only be achieved by subsequent open market selling.

While it may be standard (if illegal) practice to cassette-tape the latest Blondie hit, mag-taping the collected works of Computer Associates or I.P. Sharp Associates would not be treated so lightly.

The conference organisers say that the aim is to cover all known piracy and illicit copying practices. Had the conference planned to uncover such abuses, those involved would already have booked on the first plane out to Argentina. Similarly, had the conference concentrated on listing the abuses served on the DP user by the software industry, then the conference proceedings could have lasted several weeks.

A recent example was the unbundling at the installation of a much needed application package. Apart from the fact that delivery was more than one month behind schedule, the programming language, it was quickly discovered, was very much basic German and translator kits were not provided.

Challenge

Most DP managers could recount similar tales of woe. Even tailor-made packages, expensively supplied by professional software houses, have their faults, ranging from such basic factors as a genuine misunderstanding of what the program was supposed to achieve and on what level of equipment it was supposed to run, to where vendors have certainly established a far from enviable reputation for supplying the wrong product at the wrong time.

A leading authority, Tom Stewart, of Butler Cox & Partners, told a recent conference that poor software design costs far more than rush reward terms than poorly designed hardware. Getting the software interface right at the start is a major challenge for all levels of system design.

Keith Bedell-Pearce, a solicitor specialising in computer affairs, suggested that exclusion clauses in certain software standard agreement forms contravene normal exclusion of liabilities.

Other legal authorities, Lord Lloyd and barrister Alistair Kelman, members of a Parliamentary group, have expressed concern over software copyright.

Spotlight

In the US, controversy rages over whether software is best protected by trade secret law, copyright or patents. A shortfall of 50,000 programmers in the States is thought to be behind the increase in misappropriation, theft and improperly acquired proprietary software. Given the same level of staff shortages and the growth in business micro applications, it seems that software in the UK is set to leave the shadows of computing and emerge into the spotlight of attention.

Alan Simpson

DOWNTIME

Norman the Mailer is on his way

ANOTHER unnerving example of American "progress" has made its inevitable way to our shores. On show at Info 81 last week was the Bell & Howell Mailmobile, as shown in my picture (the thing with the hat, not the lady, sadly). This is a driverless, yet not strangulless, mould office delivering the mail, thereby putting 2½ million messengers on the dole queue.

It follows a preset trail of fluorescent material that has been laid on the floor. It stops at predetermined places and beeps noisily to summoo office staff to come and snatch the mail off it before it starts up again.

As it trundles along it also beeps and flashes blue lights if someone should be obstructing enough to get out of the way. It has various devices to stop it so that it doesn't run over anyone.

The contraptions are already in widespread use in — where else? — US government offices and Citibank in New York. Each one tends to acquire a nickname, such as "Old Blue Eyes", "Stalking Tom" and Norman the Mailer.

The human beings left in these offices are far from universally pleased with their new workmates. The need to drop whatever it is you are doing and dash out to tend to the thing when it hoots at you can bring chaos to the most serene office.

The machines can incorporate a resident prayer so they can telecram all and sundry as they peel away for their many runs. One American office finally drove an office worker beyond the limit: he shoved the mail-demaning machine into a lift and sent it off to another floor, where it was doubtless totally baffled about what to do next.

The [illegible] can [illegible] if [illegible] enough [illegible] get out of the way [illegible] various devices to stop it so that it doesn't run over anyone.

The contraptions are already in widespread use in — where, else? — US government offices and Citibank in New York. Each one tends to acquire a nickname, such as "Old Blue Eyes", "Stalking Tom" and Norman the Mailer.

Is what's in the boxes of the robot mailmobile, makes it UK debut or life (I)

Homework, White House style

POOR Jimmy Carter. You would think that now he is out of office there would be an end to the string of stories making him and his entourage look like the biggest bunch of clowns since Barnum and Bailey.

No such luck. The Amy Carter [illegible] is [illegible] a real [illegible]. Departing backsides, but maybe it will spawn some more healthy scepticism about computers.

According to the Washington Post, Amy, struggling with her history homework, one Friday, asked her Mum a question about the industrial revolution (the first one they haven't got round to the information revolution in Washington schools yet).

Mum, equally flummoxed, told one of her aides to call the Department of Labour, which he did.

The next-to-joker civil servant there thought this was a request from The Man Himself and spent the entire weekend doing computer analyses of the industrial revolution. On the Sunday afternoon a truck turned up at the White House loaded with printouts that cost, reportedly, many thousands of dollars in overtime and machine time to produce.

The crunch is that despite this assistance Amy only got a C for her essay. She should have complained to her teacher that it was not her fault. It was a computer error and so it should have been the machine that got the C.

What a wonderful new [illegible] excuse for schoolkids!

On the other hand, perhaps the US Government is not [illegible] much success in managing the economy if it still hasn't got to grips with the 19th Century.

Tailpiece

IT seems that Robotron, the East German computer maker, has introduced a seat reservation system for rail wags which it calls Automatic Reservierungs-System 80 (ARS 80).

The choice of name is no accident, as part of a special effort to boost marketing in Western countries, the firm is plugging the system heavily under the acronym ARS/W.

(Thanks to Computer Weekly's correspondent in Berlin.)

ComputerWeekly

Quadrant House, The Quadrant, Sutton, Surrey SM2 5AS

Thursday, February 19, 1981

Credibility and conferences

THE goodwill that goes to the grave with a defunct company is hard to resurrect. Despite optimistic noises by Infotech founder Ray Goodman — currently running a company called Know Now — that parts of the conference, training and publishing company can be revived, it will be a rare speaker who will perform at its next conference before getting his fee, and a bold delegate who will pre-pay his attendance ticket.

Infotech has gone into liquidation for the third and final time, and with it has gone more than money. It was neither big enough nor important enough to warrant national newspaper treatment, or questions in the mother of parliaments. But to our industry Infotech was significant.

The State of the Art conferences run by the company were, in their concept and execution, unique. They gathered together in Britain some of the most prestigious speakers in the industry, and an audience to match.

In general the leading edge of computer development, particularly at the point when ideas and projects begin to be converted to products for the marketplace, is sited in California and, increasingly, Japan.

What Infotech achieved was a sufficiently attractive to draw their best representatives to Britain. The opportunity to better understand our main competitors was invaluable.

A glance through the list of speakers at last November's State of the Art gathering showed the quality of the event the company had created. Had it run its finances as successfully as its ventures it would not now be in liquidation. And that, unfortunately, is the sad lesson for the conference business.

For the plain truth is that too many organisers — and the above comments make clear Infotech's major event is excluded here — are being cavalier with the conference idea. Only three weeks ago, for instance, the organisers of the four-country Soft 81 series of software shows, which they had announced at the end of the last year, called them off.

Now Infotech, apparently the grand-daddy of them all with a turnover of at least £3 million last year, has been nudged into liquidation by what chairman Clive Wilkins says is a debt of just £15,000.

A conference, much more than a product, is dependent on its organiser's credibility if it is to be successfully carried through. This is where irrevocable damage has been done.

For, to labour the point, it is the delegates' willingness to put their attendance price up-front which extends the credit necessary to run many of these events. And the speakers' willingness to postpone payment until after completion.

At the very least, the failure of a company like Infotech will cause lecturers to be a lot more cautious in promising to jet round the world to give speeches at various prestigious events in a blaze of light to the thunder of applause.

Companies and individuals who cannot afford to lose even the few hundred pounds involved in going to a conference will be cagey of the next invitation they receive. Despite the fact that their attendance will invariably spark the germ of a successful idea, provide the clinching expertise for the development of their product, or allow the chance meeting with the person whose company can provide the money or talent to allow their project to fly.

Of course it is easy to advise the would-be participant to look closely at the substance of the organiser before parting with time or money. The point is: He still needs to go.

So those high-fliers who seek to make money out of conferences (and if the product and price is right, good luck to them), yet end up scouring potential delegates and speakers alike, do the computer industry as a whole a disservice. One whose effects stretch a long way beyond the immediate loss of money and jobs.

1984 and all that . . . .

THIS week's example of the strange things people say in the media about computers was sent in by L. H. Buchanan of Altrincham, Cheshire, who wins £5.

"Computer programmers, who earn about £300 a week, may soon lose their jobs because computers will be able to write their own programs. This is the result of a device perfected by two British inventors.

"The device, invented by Messrs David James and Scotty Bambury, in Minister, Somerset, can be fed into any computer and is known as The Last One because, in theory, it is the last program that any human would have to write.

"The significance of the development is that it will remove completely from human hands the tedious task of writing long programs and sifting them for errors. The computing community is astounded by it."

Adrian Berry in the Daily Telegraph

LETTERS

A bright future due for APL despite radical differences

I AGREE with the sentiment expressed in the letter from Greg Michaelson (CW, February 5) when he says that your series on minority languages would be greatly enhanced by some descriptions of their features and examples of their use. However, I must most firmly take issue with him when he states that the absence of illustration in the APL article is just as well!

Far from being arcane, as Mr Michaelson says (I hope he doesn't tell his students that), the APL alphabet is extremely concise, open to all, and learnt very quickly. I teach a one-day APL appreciation course for managers. At the beginning of the day I frequently provide the managers with a set of English words which the system will accept. By the end of the morning the delegates have invariably dropped them in favour of the APL characters.

I am also happy to say that the days are long gone when APL terminals were hard to come by. I have not come across one single commercial user who was put off by the need for an APL terminal. Telephone almost any rental company and they will tell you about the range. If there is a small extra charge, it is recouped within days by APL's higher programmer productivity.

The point which may have been missed, is that APL is fundamentally a higher level language. It was designed to free the user from the problem of using the computer, and instead allow him to concentrate on solving his own problem. APL manipulates whole sets of data as traditional languages manipulate individual numbers, concisely and interactively. The result, as Val Lusmore says, is a 10-fold increase in programmer productivity — and no computer user can afford to ignore this.

It was brave of the APL founding fathers to specify a language so radically different — character set included — for radicalism always attracts criticism. However, despite this, APL is becoming widely accepted in business and as programmer-costs continue to represent an ever-increasing portion of computing costs, we look forward to a bright future.

I shall be sending Mr Michaelson (and anyone else who so requests) the examples of APL in action that he wanted.

JAMES SINCLAIR
Consultant
I.P. Sharp Associates
London, SW1

The Editor welcomes letters commenting on subjects published in Computer Weekly, or on original topics. All letters must be accompanied by the writer's name and address, not necessarily for publication. Letters may be cut.

G. M. KENDALL
Lake Street
Oxford OX1 4RA

Overstepping the mark

IT is part of the function of a responsible journal to provide a forum for controversial and stimulating viewpoints. Occasionally, however, even a responsible journal can overstep the boundary and stray into areas which are positively misleading and downright distasteful. I am sorry to say that Computer Weekly overstepped this mark with the article by Paul Fisher (Op Spot, January 15).

Mr Fisher describes the question of VDU operator health as "one of the burning non-issues of the day" and is scathing in his comments on reports prepared by ASTMS and the Health and Safety Executive.

Mr Fisher's remarks are misleading because the study of the physical and psychological effects of working with VDUs is serious and worthwhile. For many years computer experts were accused of installing systems with regard only to their money-making potential or technical interest, in total disregard of their impact upon people. The result was an attitude of profound mistrust between managers and managed, and great barriers of suspicion were built up. These barriers are gradually being lowered as more and more computer experts demonstrate their understanding of and concern for human factors. Presumably Mr Fisher is in favour of re-erecting these barriers.

His comments are also distasteful. He suggests that cases where VDUs have damaged health are unimportant because they are rare. There are two answers to this callous suggestion: No industrial malady is ever trivial for the sufferer, however rare it may be. Mr Fisher must also realise that the way to keep the number of VDU casualties low is to encourage, not scoff at, related research.

Black mark, CWI Two black marks, Mr Fisher!

(Mrs) STEVE SHIRLEY
Vice-president (Professional)
British Computer Society
London W1M 0BP

Not just for criminals

I REFER to an article "Criminals only" pledge on Scottish Police System" (CW, January 22) and would like to point out a number of inaccuracies which appeared.

The Lothian and Borders Police development is an information system based a wide range of administrative applications such as personnel, lost and found property, firearms and shotgun and crime reports. A small part of the system consists of records relating to convicted criminals. The development is not therefore an intelligence system similar to the Thames Valley Police network.

I would also take issue with your reporter's statement that this force recognises the questionable nature of the Thames Valley system and that talks have taken place between the two forces. At no time have talks relating to computer developments taken place between the forces and this force does not consider that the Thames Valley system is of a questionable nature.

W. S. PRINGLE
Deputy Chief Constable
Lothian and Borders Police

Search for people

WITH all the gloom and despondency surrounding us — jobless at a record high, opportunities for graduates becoming scarcer — you would think we could find R&D specialists.

Much against the trend, we at ABS Computers are expanding rapidly on all fronts. In the Research and Development area we have some fascinating projects which are quite at the threshold of current technology — yet, no matter how much we advertise, we find it impossible to find the right people.

Perhaps it is because we need the people in Brighton, but then we have offered top salaries. We are experiencing the same problems with the recruitment of project managers (Manchester and Ricksmansworth) and commercial programmers at Brighton.

I wonder if any other UK companies have had the same problems in recruitment and would appreciate any suggestions or comment from other readers — especially those who have solved the problem.

ELIZABETH LAST
Software R&D Manager
ABS Computer
Woking
Surrey GU22 7UZ

Computer-related fraud

IT is sometimes reported (e.g. the article by Morris Edwards (CW, January 29) that there is a great deal of computer-related fraud. Mr Edwards mentions $2,000 million a year and says this is expected to rise dramatically.

It would be very interesting to have more details. In particular, it would be useful to know how much of it is "ordinary" fraud on systems which happen to be computer-based, rather than special new kinds of fraud which can only happen on computer-based systems.

It would also be interesting to know how much fraud would not be prevented by standard computer security — such as the use of regularly changed passwords, but would be prevented by the sophisticated encryption techniques described by Mr Edwards.

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Oxford OX1 4RA

Software survey

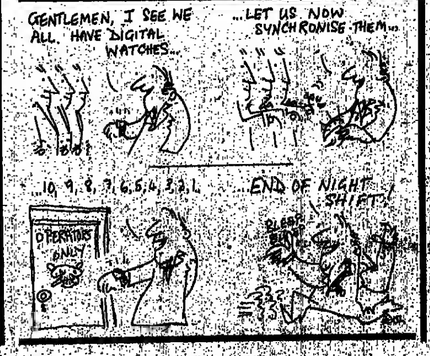
ON behalf of the Special Interest Group in Business Applications of the UCSD p-System User Society, I am conducting a survey of commercially available software for use with the UCSD Pascal System, with special reference to business applications. If any readers market such software, I would appreciate receiving details.

This information will be collated and published in a future issue of the USUS(UK) Newsletter. Details of software available using other implementations of Pascal would also be welcome.

In addition, if anyone has any comments or opinions based on their own experience of using Pascal in a commercial environment I would be most pleased to hear from them.

TOM SHORT
Chairman
SIG in Business Applications
USUS(UK)
Chapel Cottage
Sand Road
Great Gransden
Sandy
Beds SG19 3AQ

Liveware File by Don



OP SPOT

Site where ops is the route to management

"INFORMALITY and professionalism need not be mutually exclusive," says Jim Cameron, the DPM at Leicester County Council's Univac installation. It's the kind of site where everynne knows everyonc else and, perhaps more importantly, sees everyone else.

Glass partitions separate programmers from data prep, and then from the computer room. Four managers' offices stand opposite this overall computing area.

"We don't encourage segregation here," says Cameron pointing to the open plan arrangement. "On some sites, operators don't even know where the programmers are."

As far as career paths go, the conventional computer divisioos of labour are not altogether respected at the Leicester site. Simon Bankin, for instance, moved sway from operations to become senior control clerk and says: "I wouldn't want to go back to it, especially the shift work."

Operations manager Frank Heanaghan has had an even less typical career, having spent the first three and a half of his eight years on the site as a systems analyst. He switched to operations "In order to take an opportunity to become involved in management".

The notion that operations is the best DP route into management is echoed by shift leaders Paul Plail and Keith Martin.

"Having come up through programming," says Heanaghan, "I can appreciate programmers' problems and they know that I know." He places an emphasis on programmers understanding what goes on in operations and new, inexperienced programmers have to spend a couple of days in the machine room after they have arrived on the site.

There is now a fairly rigid graduate career structure for programmers, making the move out of operations difficult for the ops.

Recently there has beeu a low turnover of staff among the operators, which reflects the difficulty in finding fresh jobs. An advert for a junior op in the Leicester Mercury had over 120 responses, which is more than four times last year's response rate.

Most of the ops have started at a junior level because there are not many experienced Univac operators in the area. A spin-off from this scarcity is the policy to promote from within.

Only one of the current batch of nine ops is over 22, which makes their average age about tho same as the Leicester City football team.

All training is done on site and is the resposoibility of chief op Hasu Mistry. His career has been conventional, having started at the site seveo years ago as a junior.

The ops themselves work a three-shift system from Monday to Friday, on a strict four-month rota, working nights one week in every three. The rota is designed so that within the four months each op works with the other eight.

"We're a close-knit team," says shift leader Allan Ralph. They earn a 20 per cent shift allowance worth between £1,500 and £2,000 on the council grade of their salaries.

Those I spoke to said they had adapted to night work and liked the free time it gave them during the day.

The site has been with Univac kit for eight years and before that it had an ICL 1902A. It has to cope with the payroll for 33,000 council employees and handles 10,000 invoices per week. There are 30 terminals scattered about the county with 20 schools sharing four telephone lines.

"The service to the schools," says one of the ops, "has very little effect on our work."

Heanaghan says that his daytime priority is to keep the terminal users happy, and to keep some batch work ticking over. The large batch work is left for the

night shifts.

It is primarily a

system with five

8433 disc drives and

megabyte 8434s. Some

of half-inch tape

They have just

Level 33 of the

system to Level

worked with it for

consensus was that it

an improvement.

Allan Ralph says

sages it gives

meaningful and it

slightly faster." The

put and output

slightly but the

remained similar.

Although I was

for a short while, it

most relaxed I've

took over Op Spor.

"Look at that

the ops as I

"He's a programmer.

got a shirt, trousers,

almost normal!"

Frank Heanaghan, ops manager. . . . "Having come up through programming I can appreciate programmers' problems, and they know that I know."

Ideal for the future: Allan Ralph, on the left, would like to give it a try but wouldn't like to say goodbye to his shift allowance. Hasu Mistry has toyed with the idea of doing contract work in France but he has himself a mortgage. Paul Plail has no plans to leave operations and that it will give him the chance to move into management.

Hasu Mistry, senior operator. . . . All training is his responsibility.

Truth of Battle of Hastings

THE humbling of smart quiz masters like Magnus Magnusson and Nicholas Parsons is always good to see. Well, a couple of readers have been busy doing a cut-up job on Op Spot's quiz of January 29.

"Where," went one of the more searching questions, "was the Battle of Hastings?"

Fanny La Tour, who describes herself as a formed programmer from Hastings, writes to dispute was not in her home town at all but at a called Senlac.

She responded to the about what computer by saying: "They play tape library, or change the disc drives, or mow during the night shifts."

Such is the prejudice most reformed

All, however, is

juiciest scoop yet.

Queen Mother's

the question.

Scandal

"By god, sir," she dare you take up

dal? This story,

world, would rock

Another correspondent from Exeter University

to history but to the

discover the identity

question.

"I quote him, in full

Although Queen

commonly (also

"Queen's mother," it

the widow of a former

is also the mother of a

sovereign." (Collins

mar 1979).

"So, were the

a king, and very

and the widow

the answer "the

connexion

consumption

married, and

This is so

Science Uncoiled acts as a launching pad for Selesort

Michael Deans trained as a biochemist but eight years ago chose to become a computer programmer with the London borough of Hounslow. He has achieved prominence through his development of Selesort, which has beeo described as "the finest and fastest set of sort programs for micros". Selesort is the subject of his still unpublished book, Science Uncoiled.

"MICHAEL DEANS hss produced the finest and fastest set of sort programs for micros." These are the emphstic words of Cyril Grant from the Microcomputer Centre at Sheen, London.

He goes oo to say that "they are years ahead of the rest of the market at the moment."

Deans is a 33-year-old Londoner who traioed as a biochemist, but has been a programmer for the last eight years with the Loodon borough of Hounslow. He wrote Selesort two years ago aod the story behind its production is as interesting as the programs.

He explained, "I acquired a Pet system in 1978 and found I needed to learn machine code for another project I was working on. To gaio practice, I decided to write some system- software for the Pet, a friend suggesting a selective sort as there wesn't a suitable ooe."

Deans wrote a sort/merge facility, similar to those available for large mainframes, offering up to 15 specified sort fields.

Catalyst

Depending on their complexity and the initial ordering of the data, it will sort around 2,500 records, or 20K of data, in a few seconds.

Running under ACT, a sequence of sorts and merges typically needed for 39 double density tracks takes about half-an-hour.

His "project", the initial spur to learning machine code, is a book called Science Uncoiled, which he wrote between 1974 and 1978. It expounds some of the theories and beliefs he formed during his biochemistry studies at Cambridge and London.

In a layman's nutshell, Deans hypothesised that the primordial soup (the original murk from which sprang all molecular life on this planet), contained enough of the right sort of energy supplied by cooling of ice crystallised in liquid nitrogeo, to set off the necessary chemical reactions to start organic life.

When his first co-ordinated these ideas, Deans was unable to get backing from a university research department to test his theories, but continued to refine them until eventually he produced Science Uocoiled.

If he is right, there are some important spin-offs to his theories. Certalo trace elemeots ootably lacking in Western diets may contributa to the high locidence of degenerative diseases, like cancer and heart failure, in the Western world.

These ideas are unproved, however, and the absence of experimeotal corroboratioo or appearance of articles in scientific journals has oot helped in getting his book published.

Thwarted by both research departments and publishers, Deans decided to harness the blossoming sort program to his issues, reasoning that money accrued from developing a successful software system should go quite some way towards finaocing his project.

"I intended to put the royalties into a charity fund and offer it to soy department that would investigate my ideas. My target was £500,000", Deans explained. With this in mind, he developed Selesort in a systematic fashion.

Selesort is presented ss a Basic program for disc or tape storage with quite a large portion — around 5K — of machine code divided loto two main parts, the sort field compiler and the sort/merge module.

Both are overlaid at the top of RAM, while subsidiary machine code sub-routines fill both cassette buffers.

The rest of the program is written in Basic and is concerned solely with file access with a theoretical limit of 64 sub-files each with 85 records, a total of 5,440 records.

Similarly, the sort-merge is capable of merging 64 ioput files at one operatioo in theory but since file opening and closing is the slowest part of the system, the optimum number of files for overall speed is around nine in practical terms.

Conventional

Besides mare conventional alphabetic and numeric sorts, data can be re-arranged in a variety of ways — upper and lower texts can be sorted together, or binary and floating point numbers differentiated.

To illustrate Selesort's uses, particularly io selecting a specific record type for display, loformation or editing, Deans has produced a series of theoretical case histories.

One application he describes is a sort into ordered lists, such as alphabetic registers of students, teachers, or employees.

Records may be held on file in any order — seniority, works oumber, etc, but by using Selesort the whole file, or up extract, can be copied and sorted alphabetically, leaving the original order undisturbed.

Merging short-term files into a more permaneot form with subsequent sort, can have advantages over a direct access update. Where a ceotral file is maintained to cover separate installation files, update is often by real time direct access.

An alternative is to merge individual periodic transaction files and re-sort into the central file order.

This allows either sequential update of the ceotral file, or merge of the new and trasoaction files, both occupying the micro and operator for a few minutes at various times rather than several hours at the end of the month.

A sort can also usefully update customer accouots where payment is falling due. Using Selesort's ALTN feature, a file organised in customer order can be split into accounts-due-now at the front in asceoding order of amount, followed by accounts-due-next-week in desceoding amount order.

A personnel file could be sorted similarly on the bssis of several key features — perhaps Urdu speaking with IBM experience — ioto a short list or, by specifying a category to be excluded, screen out certain candidates.

Sorting out words is another application. If each word is defined as a record in a processing system, it can be sorted as required, the duplicate feature listing all repetitions of a word throughout the text.

Spelling and technical jargon can be checked by compnring the duplicate list against s standard of all common words and terms. An "unmatched" output report indicates error or explanatioo.

Searching the phone directory for a John (Jon?) P . . . may seem a lost cause, but apecifying that the name field "contains a "J" will bring a list to tbe front of the file.

Looking for subsequent 'o' or 'O's, 'n' or 'N's', produces further lists which csn be eross-checked or eliminated, this technique extending to other mislaid items, references or classifications.

A selective sort can also handle chores like cheeking one file against another (did we update this month?), preparing indices ond calculating statistics.

"I'm in the process of customising Selesort," said Deans, "in run it under other systems such os CPM. That is sbout half completed."

How successful has the scheme been? Not totally, Deans admitted.

He had had s good deal of favourable feedback on Selesort but there had been practical difficulties in getting it adopted by software publishers.

"I'm told there is little demand for s more sophisticated sort. The whole acceni now is on user-friendly, complete business syatems incorporating a more limited sort.

"Users seem satisfied with this; they either don't realise what else is available or don't want to get involved."

He added: "I think it's also a question that people don't yet know enough of what the computer can do."

Did Deans think he'd made a mistake in his original assessment of the market? If so, what now for Selesort?

"Yes, I think I did get it wrong but I shall go on tidying up Selesort and, if I package it, I may be able to interest the smaller business, like s job agency or stock control, where a selective sort is needed."

I asked a little tentatively what would now become of Science Uncoiled.

"I have quite a lot of work to do on it — perfecting the database on the Pet, final revisions and rewrites, that sort of thing."

"I also have some more thoughts on software. I'm considering developing into graphics, using the Pet to produce pictures with the aid of data compression techniques.

"That fits in quite well with my work on assisted learning programs in primary schools for Hounslow Borough.

"There may also be s future in video games linked to pop songs or film characters. The software to tie the game to a theme would be prodigious but a package to ease the load may be commercial."

I left Deans reflecting on all the possibilities open to his agile mind. He isn't at all downhearted.

"Whatever the outcome," he says, "I don't feel too hindered. I've enjoyed my theories — they've given me intellectual exercise and the chance to compare ideas with other minds.

"Meantime, my book has had time to improve and the recession won't last for ever. Time will tell in the end if my ideas are right — and that may be in 20 years or next year."

PUZZLER

(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)

In this moving counter problem, the task is to reduce the position to just counter No. 1 by means of 15 draughts-type "captures" carried out either horizontally or vertically, by jumping over an immediately adjacent piece. No diagonal "captures" are allowed, however, and all moves must be made on the available 3 × 8 matrix.

To make the project clear, here is a possible "try": 2 × 10 (removing 9); 1 × 2; 4 × 12, 1 × 4, 14 × 13; 6 × 5, 11 × 14, 5 × 13; 16 × 15; 8 × 16; 1 × 8, 3 × 11. But counter No. 3 cannot be eliminated because of the intervening square. See page 33 for solution.

DATA ANALYSIS

Matrix is last phase in entity life cycle analysis

Elementary Function (Event) / State	Booking	Cancellation	Appointment Time Expires	Patient Arrives	Inquiry	Archived
Not Known to System Business	booked	E	E	E	E	E
Booked	E	cancelled	broken	kept	booked	E
Broken	E	E	E	E	broken	archived
Cancelled	E	E	E	E	cancelled	archived
Kept	E	E	E	E	kept	archived
Archived	E	E	E	E	E	E

Figure 1. Entity life cycle matrix (Appointment).

Section 1 — Part 18
of our series describing a system design methodology

by Rosemary Rock Evans

IN Parts 16 and 17 entity life cycles have been examined as a method of checking that all the events and functions have been analysed, providing validation rules for use in system and program design and designing programs around entity types.

Now we examine the last two purposes more closely, using the last phase of entity life cycle analysis — the entity life cycle matrix.

The entity life cycle matrix provides information required in order to design verification and transaction processing programs for entity types: it shows:

- Where a transaction or event is invalid for an entity in a given state.
- Which elementary functions are invoked as a result of a transaction when the entity is in a certain state and what effect the function has on the state of the entity.

In Figure 1, the entity life cycle matrix for the appointment entity type is shown, using the events isolated in the Part 16 article on entity life cycle analysis and the valid states identified in Part 17.

The valid states are listed in the left-hand column of the table and the events and elementary functions they initiate are placed at the top of each column.

Drawing the matrix

Intersection of the rows and columns shows the resultant entity state after the function shown in the column heading has been executed on the entity in the state described on that row.

In our example, the resultant state after the function "Cancellation" is "Cancelled". Where the function is invalid for an entity in that state, E denoting error is used.

An entity life cycle matrix is drawn for each mutually exclusive group of entity sub-types found, as described in Part 17.

Hence, there would be one matrix for the group of states.

(Referred
(Discharged
(Admitted
(Archived

There would be another matrix for the group of states:

(Under 16 Single
(Over 16 Married
(Over 16 Divorced
(Over 16 Widowed
(Over 16 Single

if we were completing entity life cycle matrices for the patient entity type.

Summary

Before leaving entity life cycle analysis to deal with other topics, it is worth stating some of the advantages to the analyst of the entity life cycle approach and its end products.

The Valid State table and entity life cycle diagram (if it is not too complex) and entity life cycle matrix provide a means of checking methodically, with the user, all the valid event and function sequences and all the valid states.

Validation is often ... systems analyst or ... treated as though it ... that could be done ... with the user. Available compact tool enabling ... be checked with the ... makes this task easier.

Determining of valid ... significant effect upon ... tion and identification ... bute types and consequent functions.

All attribute types ... during entity modelling ... tional analysis which ... pendent — e.g. ... identified by ... and exclusive ... from the model and ... identified from the ... exclusive functions ... checked to ensure ... truly dependent ... their definitions checked.

For example, ... said that a function ... upon whether the ... pensioner or not ... age.

If the definition of ... examined with respect ... events which affect ... could have two possible ... tions:-

1. Reaches 65 (Man) ... (Woman)
2. Is in receipt of ... being paid a pension ... fund.

The function may ... for one of these ... the function should be ... give a better description.

We are beginning ... different parts of the ... entities, attributes, ... states, etc together. ... extra knowledge gained ... up definitions and ... and possibly change ... model of functions ... what is known.

At this stage we are ... close to being able ... the design process ... now required is to ... tional networks which ... common functions ...

We make a ... the data using ... the tests for completeness ... searches and ... and then the task of ... the design considerations.

The Data Analysis ... was developed at ... Palmer.

CONFERENCES

■ Proprietary software costs about one-tenth of the price of developing similar systems in-house, and bearing this in mind, MSA has organised a series of seminars which will assess the time that can be saved by installing an integrated ... application software. The seminars will also cover the problems of evaluating and installing proprietary packages such as general ledger, financial forecasting and modelling and fixed assets accounting. The venues are: Savoy Hotel, London on March 4; Metropole Hotel, Birmingham on March 12; Sheraton Skyline Hotel, London Heathrow on April 22. Details from Dan Schmidt on Maidenhead (0628) 71011.

■ [illegible] ... computers in the ... industry will be ... the Metropole Hotel, Birmingham, on March 10 and 11. [illegible]

view. In the ... with the ... tives of a range ... manufacturers will ... for the conference ... is £50. Enquiries ... addressed to the ... ager ... New Road ... Tel: (061) 9...

■ Automation ... Trade is the ... organised by ... at the ... Heathrow ... and 12. There ... the major ... agency ... proposals for ... Costs of ... staff ... The conference ... to select a ... gain first ... tion: Zapper ... DIY system ... VAT. For ... contact ... Norwich ... London ... [illegible]

PEOPLE

Ex-CPP staff take positions at ADR

FOLLOWING redundancies made by CAP-CPP two months ago, several people have transferred from CPP to Applied Data Research Ltd (ADR), to market and support the ADR software products that were previously sold by CPP under licence. The new appointments bring the staff total to 17, more than double the figure at the company's inception in April last year. Parent company is ADR, an international company with headquarters in the US.

Michael Wood is administration manager. He was with CPP for seven and a half years, and prior to that was production controller at Computer Projects. David Turner has been appointed field sales manager for general products.

Senior technical support representative is John West, and Stephen Morton has joined as technical support representative.

Four salesmen have transferred to ADR. They are Richard Tibbetts, David Chamberlain, Richard Elms and Tony Thompson.

John Wilson joins the company after 10 months with CPP. He is responsible for technical support of Roscoe and Look.

NEVER let it be said that computer people are devoid of culture. It turns out that a young and flourishing choral society in North London, the Camden Choir, boasts a surprisingly large number of people from the industry. Among the singers, shown here in concert at All Hallows Church, Gospel Oak, are Roland Rosner of the SRC's Joint Network Team, Andrew Hinchley of University of London Computer Centre and the BCS, Roselle Beard of Ove Arup, Allen Matthews of Tektronix, and even a Computer Weekly reporter.

The choir hits the big time on June 16 with its first concert at the Queen Elizabeth Hall: Haydn's Creation with the London Bach Orchestra. The choir is looking both for sponsors and for scrap print-out paper for them to collect and sell to a paper merchant for recycling. If your firm could help, ring Matthews on 05827-63141.

Intelcom 81 Paris show called off

POLITICAL and economic problems have resulted in the cancellation of Intelcom 81, the international telecomms and computer exhibition/conference. It was to have been held in Paris from May 5-8.

Exhibition organiser, the US firm Horizon House International, decided to cancel the event following a decision by several French companies — all members of industry association SI 3T — to withdraw their exhibition contracts.

It is thought by Horizon House International that the French industry was dissatisfied with the attendance figures of an earlier exhibition held in Los Angeles. When the SI 3T companies withdrew, the French PTT, which was co-sponsoring the event, backed out.

Added to this, an all-French exhibition called Septel, running on a similar theme to Intelcom, announced plans to go international.

Horizon House International is now considering whether the Intelcom series can be reconstituted in other parts of the world.

Shipper of the year

MANCHESTER shipping officer Ian Allcroft has been named Shipper of the Year for presenting the best paper on how computers can help exporters improve their efficiency. The competition is held annually by trade journal International Freighting Weekly. Allcroft won a holiday for two in Lisbon, after being questioned on his hopes for the future of computers in international distribution.

Second prize winner was Anthony Rowan of Crosrol Ltd, Halifax and third prize went to M. W. Padbury, shipping manager of Siemens. The competition was co-sponsored this year by International Freighting Weekly, British Caledonian, SPD International and the Society of Shipping Executives.

■ **Malcolm Banks** has been appointed general manager of CCI, a Lister Group company. He joins from Cara DP, a subsidiary of Aer Lingus, where he was manager of the computer products division.

■ **Albert Dance** has been appointed by Arbat as Swift (Society for Worldwide Financial Telecommunications) project leader. He worked for two years as computer auditor for Swift in Belgium.

■ **Roger Silvers** has joined Johne and Reilhofer (UK) as technical director. He was formerly with SE Labs.

■ **Harry Gordon** has been appointed managing director of Computer Associates. He joined the company in 1979 as sales manager in Zurich, moving to England one year later. Joining the company from CPP is Clifford Smith, who has been appointed sales manager.

■ **Richard Pierce** has been appointed sales director at CAL. He was previously with Burroughs, where he was responsible for marketing the business computer product range. Also joining the company is **Mike Burden**, who becomes managing director, to launch a new product for CAL. He joins from ABS Wordplex.

■ **Clive Jenkins** has joined Data Logic's communications products division as sales executive. He was previously with Century Data Systems.

DIARY

FEBRUARY 25
Access credit card system. BCS Edinburgh branch. Mountbatten Building, Heriot-Watt University, Grassmarket. 5.30.
Development of software for linear programming. BCS Mathematical Programming Group. London School of Economics. 6.30.
Developments in data communications in Europe. BCS North Staffs Branch. Computer Centre, North Staffs Polytechnic. 8.00.
Microprocessors and applications. IDPM Norfolk branch. Castle Hotel, Norwich. 7.45.
Word Processing — a user's first year of experience. IDPM Sheffield branch. Sheffield Twist Drill Computer Suite, Cemetery Road, Sheffield. 7.00.

FEBRUARY 26
String Something Simple. BCS PL/I Group. Third Floor, Imperial House, 15-19 Kingsway, London WC2. 5.45.
SCERT — Simulation in Capacity Planning. IDPM Essex branch. County Hotel, Chelmsford. 8.00.

MARCH 3
The Role of the User/Supplier Relationship — Influence and Irritation or Fact and Fantasy? IDPM Birmingham branch. Saracens Head, Stratford Road, Shirley. 7.30.
Visit to Glasgow Herald — Computing in News. IDPM Scottish branch. Glasgow.
Visit to The Scotsman — Computing in News. IDPM Scottish branch, Edinburgh.

MARCH 17
Software houses debate: Do You Get What You Pay For? IDPM W London-Oxford branch. Bull Hotel, Gerrards Cross, Bucks. 7.30.
Information Engineering. BCS Merseyside branch. Faculty of Science Lecture Theatre, Liverpool University. 6.00.

MARCH 18
Why the DPM Needs Standards and How. IDPM Central London branch. Pearl and Dean Studio, 15 Broadwick Street, London W1. 6.00.

MARCH 25
IBM — The New Generation of Small Computer Systems. IDPM Sheffield branch. IBM offices, Crossgate, Leeds. 7.00.

CONFERENCES

■ The second international conference entitled Telecommunication Transmission — Into the Digital Era is to be held at the Institute of Electrical Engineers (IEE) from March 17-20. Sessions will cover such topics as network planning and performance, PCM and digital multiplex, radio relay systems and video. Several technical visits have been organised for the final day of the conference, for which advance registrations are necessary. These include visits to British Telecom Research Labs, STL at Harlow and Plessey Telecommunications at Maidenhead. The conference is being held in association with the Institutes of Physics, Mathematics and its Applications, and Electrical and Electronic Engineers; the Institution of Electronic and Radio Engineers and the Convention of National Societies of Electrical Engineers of Western Europe. Details from Public Affairs, IEE, Savoy Place, London WC2 0BL. Tel: 01-240 1871 ext 280.

■ The linking of private computer systems and databases to the Prestel viewdata network is the theme of a conference to be held on March 18 at the Royal Garden Hotel, London. Organised jointly by Systems Designers and British Telecom, the conference will cover experience with the Bildschirmtext network in West Germany, British Telecom's plans for introducing the facility in the UK and the options and opportunities for participants in the UK service. Further information is available from David Gilbert, Systems Designers, Viewdata Division, Systems House, 1 Pembroke Way, Camberley, Surrey GU15 3XH. Tel: (0276) 62244.

ملحق صفحة 1 الأصل

BOOKS

How to ensure the best choice of multiprocessor

Multiprocessors: A Comparative Study, by M. Satyanarayanan. 201 pp. £14. Prentice/Hall International, London.

DESPITE the influx of microcomputing and compact business systems, the multiprocessor market is expanding.

Cost-effective computer economics for the large-scale user gives a prominent edge to the medium and large system, especially when multiprocessing benefits apply.

The book's introduction suggests that much is known about academic and research multiprocessing equipment but there is no such wealth of knowledge relating to industrial and commercial systems.

In fact, manufacturers' manuals offer only marginally relevant material. Correcting this sorry state of computing affairs was the challenge presented to the author.

It is refreshing to find a technical writer who is both well informed and capable of informing his readers.

M. Satyanarayanan, who is a member of the Department of Computer Sciences at Carnegie-Mellon University, has produced a first-class review of eight major multiprocessing computer systems.

The format established is a general purpose review of each system followed by in-depth studies and evaluation, each section covering the central processor, input/output channels and operating procedure.

Satyanarayanan probably reflects the majority viewpoint that the Burroughs B7700 is a fine system once mastered. Similarly, the IBM 370 model 168 is given an encouraging pat on the CPU.

The author adds the reservation that there is room for possible improvement in the I/O substructure.

He expresses rather more hesitation about the DEC PDP-10 but does acknowledge that the system is capable of meeting the requirements of most popular time sharing systems.

There is a highly comprehensive bibliography which appears to have encompassed every journal or magazine published since 1970.

Published in the Prentice-Hall software series, the book is valuable reading for everyone involved at operations level or those just contemplating taking the multiprocessor plunge.

Prentice-Hall acknowledges the assistance the compiler received from the associated university computerised production facilities. The further reading guide suggests that the compiler also has access to a multiprocessor data bank.

ALAN SIMPSON

Bit like a classroom exercise

The Use of Microprocessors, M. Aumiaux, 198pp., £12. John Wiley & Sons Ltd, Baffins Lane, Chichester, Sussex.

THE DAY when the publisher of a computer book actually assumes that the reader has some previous knowledge of microprocessors will be notable.

The Use of Microprocessors is no exception and the reader is once again deep into the heart of mathematics, physics and basic computing principals before he can say flip-flop or floppy disc.

Using microprocessors is just about the one subject not covered in the volume and How To Use the Micro would be a far more apt title.

However, allowance has to be made for loss of amplitude, the book having been translated from basic French to practical English. The translator did not attempt to convert French francs into pounds sterling or interpret such statements as "The cost of the microprocessor and its extra components are significant only when large numbers, 1,000 or more, are involved. In this case, when the cost of the design study is divided between each system it can become lower than the price of the components."

A further riddle is why the publisher could not commission an English-speaking author — the species must be readily available in the UK education network.

Had a non-French author been involved, the resultant book would not have been so biased towards the Intel 8080A and Motorola 6800 systems.

The book reads like an extended lecture or classroom exercise and readers are invited to attempt a set of questions at the end of each section with answers provided at the end of the book. As an exercise, the book cannot be awarded high marks.

Publisher, author and translator could perhaps have done better, and it is to be hoped that in future editions the book, published in the Wiley Interscience series, will include more comprehensive indices plus an up-to-date bibliography.

It would also be advisable for the book to be directed towards the popular personal computer market.

A.S.

When IBM is expendable ...

Your First Computer by Rodney Zaks, 258pp. Sybex Inc., 2344 Sixth Street, Berkeley, California 94710.

JUDGED purely on publication rates, the marketplace for books on first-time computers could well rival that for computer equipment.

Latest in an apparent never-slackening line of helpful advice offered to potential computer users is Your First Computer — A Guide to Business and Personal Computing, by Dr Rodney Zaks, a prolific American writer and teacher on all things microcomputerised.

Your First Computer, it should be established clearly, is expected to be a Pet or Apple. IBM is mentioned only peripherally as being a supplier of a model 5120, a model whose price is higher than most integrated computers.

Having dismissed the world's major computer supplier, the book launches into brief, but nevertheless highly relevant, descriptions of other manufacturers and products.

As a basic primer for microprocessor enthusiasts, the book offers a comprehensive and enlightened guide to the expanding world of personal computing.

Like so many similar books on microcomputers, it is strong on what microcomputers are and how it does, while notably sketchy on its value for the user.

Dr Zaks makes the interesting observation that tomorrow's system will always be cheaper than today's. Readers should not sit back at this point until such time as the micro is given away with the software at the local branch of W. H. Smith.

According to Dr Zaks, everyone's life will be changed by the microcomputer and the universality of silicon chips is closer than we thought.

An appendix, listing current US microcomputer magazines makes a fascinating study. Dr Dobb's Journal, Nibble and Silicon Gulch Gazette certainly suggests that the industry is more lighthearted than the Klondyke rather than a factory floor.

A.S.

Bringing accountancy up to date

Guide to Systems for Practising Accountants, Ed. R. Knight. Computer Guides 1980.

PRACTISING accountants are aware by now that their professional systems are readily acceptable to computerisation but are paradoxically, although some of their clients may have been using a computerised system successfully for some time, using a computer in the accountant's own office is still comparatively rare.

Because of the cost of a mainframe machine and the lack of expertise, all but the largest firms have found it necessary to employ a computer bureau.

Now the position is changing rapidly and the professional accountancy journals comment regularly on the cheaper and smaller systems that are becoming available.

Guide to Systems is a useful introduction to computers for practising accountants and surveys the range of available facilities. It considers the specific requirements of profits and auditing and assesses where it is unlikely that specialist staff will be employed and their job is a marked emphasis on the mini-computer and the microprocessor.

The first third of the book includes a good introduction to current developments while the remainder presents and discusses examples and systems classified under headings suggested by about 70 practising accountants.

There is also a section giving hardware particulars for each system mentioned.

The compilation of such a guide is a commendable undertaking and one that provides other books on the excellent review of the field and should help accounting firms which wish to computerise some of their activities.

M. T. WHITE

Dr. PETER WALLIS surveys the latest on languages

Simula textbook takes pain out of learning

SIMULA BEGIN, by G. M. Birtwistle, O-J Dahl, B. Myhrhaug and K. Nygaard. 393pp, £6.50. Input Two-Nine.

A SIMULATION language based on Agol 60, Simula was designed at the Norwegian Computing Centre in the late 1960s and the present book is the revised second edition of a student text on the language first published in 1973.

It remains the main accessible reference on Simula and is intended primarily as a lucid tutorial text for those wishing to learn the language.

The book is of wider interest than this limited aim implies. First, it may be read as an entertaining and thought-provoking collection of worked programming examples and exercises, for purposes as varied as simulating a post office or car-wash, threading a maze, or symbolic differentiations.

Secondly, the designers of Simula had some remarkably advanced ideas for the period when the language was designed, such as the Simula CLASS concept foreshadowing abstract data types and quasi-parallel programming methods relating to features of later languages, like Ada tasking.

While the main parts of the book presenting the detailed features of Simula are somewhat dated, the discussions in Chapters 1, 8 and 9 on System Description, A Program as Components in Quasi-Parallel, and Simulation are still of great interest.

Although the reader is warned explicitly that the book is not about the language as a simulation system, the discussions of computer simulation seem particularly valuable.

Potential readers should not be deterred by the slightly old-fashioned appearance presented by parts of the book, or by the limited contemporary appeal of Simula as a programming language, this remains an important work deserving careful study.

Focussing on Pascal

Foundations of Programming with Paseal, by Lawrie Moore. 238 pp. £14.50. Ellis Horwood Publishers.

THIS is yet another contribution to the growing number of books endeavouring to teach Pascal programming to those who have never programmed before.

It is distinguished by a remarkably thorough technical approach and a useful and imaginative selection of problems.

Basic concepts such as names, variables and assignment are introduced in the first chapter and this is followed by detailed discussions of data representation before programs as such are introduced in chapter three.

All aspects of Pascal are introduced subsequently, including features like file processing, dynamic data structures and recursion that are often omitted from elementary texts. Backus Naur form and the Wirth syntax diagrams for Pascal are also covered.

Solving Fortran problems

Problems for Computations Using Fortran, by M. Walker. 238 pp. Wintrop Publishers Inc.

THIS work is based on a student use in a Fortran programming course at Grinnell College, Iowa. Part I is a general introduction to Fortran programming while Part II is devoted to discussing representative programming problems from a number of different subject areas.

The teaching method is to show the student how to develop a series of programs of increasing sophistication.

Problems stemming from a large amount of detailed program information that must be processed is handled by ingenious graphical conventions that abstract from the relatively tedious commentary.

All features of Standard Fortran are covered.

It is a commendable achievement to have produced such a comprehensive presentation of Fortran with many worked examples and problems and general remarks on programming and algorithm design in under 250 pages.

Part II presents some typical programming problems such as sorting, progressing to more specialised problems grounded in the subject.

There are sections on text processing as applied to Fortran, trigonometry, calculus, linear algebra, statistics, chemistry and physics.

Many examples and problems are given and the level of knowledge assumed in the subject seems to be somewhat above first-year undergraduate level.

Only nine days left to join the 'superstars' in this year's DP Olympic Games

COMPUTASTARS

Sponsored by Computer Weekly and Wright Air Conditioning

COMPUTASTARS and Computatug organiser Gordon Cairns is not worried man; he is merely concerned that scores of potential competitors for this year's events may not realise how close is the deadline for this year's competition.

"There are only nine days to go before the closing date of February 28", Cairns explained. "So far, we have some 35 teams on register for Computastars and fewer than 10 entrants for the Computatug, but this is only the tip of the iceberg.

"One interesting feature is that over 50 per cent of the Computastars entry comes from teams new to the competition. Some have even awarded themselves exotic competitive titles.

"Perhaps the most striking is from Kalamazoo, which has styled itself the Kalamazoo Superstars before a competitive event has taken place. There's an optimistic note on which to begin your first venture into Computastars!

"Other new entries include the Citibank Shylocks, Sandvic Vikings, Racal, the Reed Group, Microscope and Elstree Computing.

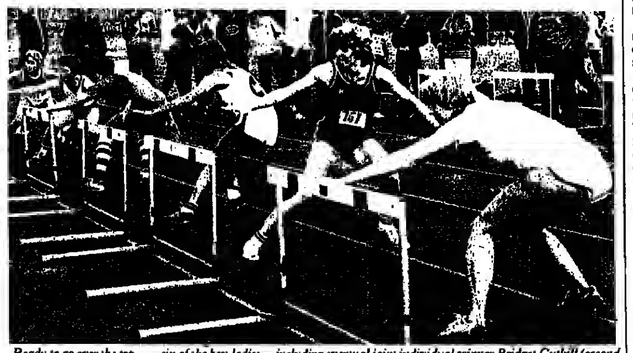
"The most intriguing entry from Computatug takes the form of Kathy's Boys from British Petroleum," he added.

There is early evidence of just how seriously entrants are taking this year's competition, which includes both a domestic and international element.

"Legal and General is entering several of the preliminary heats to help ensure its appearance in the British final — an initiative which is followed by BL, which has entered every facet of the competition."

First of the regional heats will be at Birmingham on April 25, when Midland teams display their prowess. Southern heats will take place at Barnet on May 16 followed by the Northern section at Cleckheaton on June 6.

The British final is scheduled for the New Alexandra Stadium at Perry Barr (Birmingham) on Sunday, July 26, to be followed by an international final in Holland later in the summer.



Ready to go over the top . . . six of the best ladies — including eventual joint individual winner Bridget Cuthill (second left) — prepare for last year's hurdle race at the New Alexandra Stadium, Perry Barr, Birmingham.

Weightlifting

Potential entrants who may be discouraged by the thought that Computastars and Computatug are a glorified Jeux sans Frontieres will be heartened to know that all-round competitive standards are very high.

"Last year, we introduced a pistol shooting event into the final", Cairns explained. "Competitors discharged 660 shots of which some 91 per cent were on target.

"The 400 metres hurdles relay gave an average time of 53 seconds per male competitor while the women returned a 66 second average.

"Weightlifting tests also produced some awesome figures. The leading men's team pressed a total of 5.12 tonnes in one minute, the leading competitor raising 2½ tonnes.

"An overall average of over one tonne per competitor shows how high the 1980 standard was. Similarly, the leading women's team raised over 2 tonnes in 30 seconds, while the individual winner recorded a total of 17½ hundredweight.

All last year's winners will compete again. This means that Safe Computing will defend its bureau title while Rowntree Mackintosh seeks to retain the position as best combined men's/women's team.

Rowntree Mackintosh has recorded a unique achievement since Computastars was launched three years ago. "It has been placed in the leading three in each of our three competitions," Cairns explained.

Midland Household Stores and Legal and General are the current best UK and International ladies' and men's team champions. Turning to the individual titleholders, Bridget Cuthill (Legal and General) and Lucy Baines (United Biscuits) bold jointly both the domestic and international trophies.

Those still hovering at the water's edge must submit their applications by February 28 and have worked for their present firm or bureau since February 1. Team entries cost £25 and each team will consist of five members, including a competing captain.

There are running events which will encompass distances up to 800 yards and may include hurdling. The throwing section also has a varied format, comprising flexing one's muscles with a cricket/hockey/basket or netball and a field event-style shot or javelin.

Co-ordination

Kicking includes shooting, converting penalties, dribbling, rugby drop kicks and hockey events for those whose 11-a-side preference is not covered by the two football codes.

Finally, the gymnastic section lays emphasis on the finer aspects of co-ordination, balance and bodily control.

Individual team selection lies in the hands of the playing captain, who must nominate three of his (or her) side to take part at each stage of the Computastars competition.

Computatug is also open both to teams and individual entrants. A team entry costs £5 with an individual "puller" contributing £2. Once again, potential entrants must have worked for their current firms or bureaux since February 1, 1981.

How do British standards compare with those assessed at international level? Cairns points out that last year's joint women's winner Bridget Cuthill dominated the opposition in the Atran Superstars competition.

She won against a high class field, furnishing additional proof if it were needed of the level which makes Computastars normal competition experience.

● Follow Kalamazoo's and Citibank's example and fill in the entry forms on the left, posting them to Computastars/Computatug as quickly as possible.

COMPUTASTARS ENTRY FORM

We have read and accept the conditions of entry for the Computastars 1981 competition and would like to enter .....men's teams .....women's teams

Name of team(s).....

Company .....

Address .....

.....

Nsme of contact for team(s).....

Telephone No ..... Extension .....

Signature of DP manager or equivalent authority .....

Position held .....

The unit would like to compete in the following region: NORTH (Cleckheaton) MIDLANDS (Birmingham) SOUTH (Barnet). Please circle appropriate region.

Enclosed is £..... to cover the entry fees for the team(s) — £25 per team. Cheques payable to COMPUTASTARS LTD.

In all matters relating to the rules or conditions of entry the decision of the organisers is final.

Please send entry form and entry fees to COMPUTATSTARS, 117b High Street, Croydon CR0 1QG. Tel: 01-688 6690

COMPUTATUG ENTRY FORM

We have read and accept the conditions of entry for the Computatug 1981 competition and would like to enter .....men's teams .....women's teams

Name of team/individual .....

Company .....

Address .....

.....

Name of contact for team(s).....

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PRODUCTS

H-P puts text aid on offer

HEWLETT-PACKARD has introduced the HP2601A daisywheel to join the list of peripheral products available for the company's computer systems. The HP2601A produces letter-quality output and is suitable for word processing, text and document applications.

It may prove of use with HP's recently-introduced Text and Document Processing (TDP/3000) software system.

Enhancements that usually require additional applications software are built into the printer and are fully supported by TDP/3000. They include proportional spacing, automatic underlining and centring and right justification, all of which are built into the HP2601A firmware.

Bold and shadow print may be used as highlighting tools to accentuate key phrases in reports produced on the printer.

The HP2601A operates at 32 characters per second with a metal wheel or at 40 cps with a low-cost plastic wheel and each is available in a variety of type styles. Other features include absolute tabs, margin controls, bi-directional printing and reverse paper feed.

Standard issue with the HP2601A is a friction feed platen which may be used both with single sheet and continuous forms. HP also offers bi-directional forms tractors for more precise control over feeding of continuous forms.

THE HP2601A is supplied with an RS-232-C interface which operates with all HP 3000 and 1000 computer systems and with HP terminals, including the 2645, 2647, 2642, 2626 and 2624.

Manufactured for Hewlett-Packard by Diablo Systems Inc, Hayward, California, the HP2601A costs £2,471. The product is covered by HP warranty and HP OEM and volume-end-user discounts apply, with first deliveries expected this month.

Howlett-Packard Ltd (CW), Computer Systems Group, King Street Lane, Winnersh, Wokingham, Berks. Tel: 0734 784774.

Direct to market

BRITISH distributive arm of the US international company Boles and Co Inc, Boles and Co (UK) Ltd has introduced the Direct VP800B VDU terminal to the UK.

Boles (UK) European operations director Alan Marchant describes the VP800B as "one of the most powerful software-driven terminals currently available and suitable for use in a wide range of data processing applications.

"These include time sharing and data entry — and, especially as a major component of word processing systems.

"The VP800B includes as standard a considerable number of features not commonly found on equivalent terminals. For example, it has 32K of memory, double-width and double-sized characters, an 80 character by 24 line or 132 character by 28 line display, smooth scrolling, split screen and a detachable keyboard."

Boles and Co (UK) Ltd (CW), 79A High Street, Esher, Surrey KT10 9QA. Tel: 0372 65461.

Cherry picks

CHERRY has introduced an interactive alphanumeric display system, comprising four basic modular components, usable either individually or as a system.

The modules comprise a 16- or 20-character alphanumeric display, 66-key capacitive keyboard, power supply unit, and a streamlined housing.

Cherry Electrical Products Ltd (CW), Coldharbour Lane, Harpenden, Herts AL5 4UN.

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The first third of the book includes a good introduction to computer development while the remainder presents and discusses systems by an extensive questionnaire answered by about 70 suppliers.

There is also a section giving hardware particulars for each supplier.

The book is not without its problems. Although the accountancy profession is changing comparatively quickly at the present time, this promising book is an excellent review of the field and should help accounting firms which wish to computerise some of their activities.

M.J. Hamblin

Dr. PETER WALLIS surveys the latest on languages

Simula textbook takes pain out of learning

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It is distinguished by a remarkably thorough technical approach and a useful and imaginative selection of problems.

Basic concepts such as names, variables and assignment are introduced in the first chapter and this is followed by detailed discussions of data representation before programs as such are introduced in chapter three.

All aspects of Pascal are introduced subsequently, including features like file processing, dynamic data structures and recursion that are often omitted from elementary texts. Backus Naur form and the Wirth syntax diagrams for Pascal are also covered.

Solving Fortran problems

Problems for Computer Solutions Using Fortran, by R. M. Walker. 230 pp. £[illegible]. Winthrop Publishers Inc.

THIS work is based on notes for a student use in a Fortran programming course at Grinnell College, Iowa. Part I is a general introduction to Fortran programming, while Part II is devoted to discussing representative programming problems from a number of different subject areas.

The teaching method in Part I is to show the student how to develop a series of programs of increasing sophistication.

Problems stemming from a large amount of detailed technical information that must be covered is handled by ingenious typographical conventions that do not distract from the relatively-informal commentary.

All features of Standard Fortran are covered.

It is a commendable achievement to have produced a lucid and comprehensive presentation of Fortran with many worked examples and problems plus general remarks on programming and algorithm design in under 250 pages.

Part II presents some good programming problems such as sorting, progressing to more specialised problems grouped under subject.

There are sections on Fortran programming as applied to algebra, trigonometry, calculus, linear algebra, statistics, chemistry and physics.

Many examples and problems are given and the level of knowledge assumed for each subject seems to be around first-year undergraduate level.

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Sponsored by Computer Weekly and Wright Air Conditioning

COMPUTASTARS and Computatug organiser Gordon Cairns is not a worried man; he is merely concerned that scores of potential competitors for this year's events may not realise how close is the deadline for this year's competition.

"There are only nine days to go before the closing date of February 28th, Cairns explained. "So far, we have some 35 teams on register for Computasters and fewer than 10 entrants for the Computatug, but this is only the tip of the iceberg.

"One interesting feature is that over 50 per cent of the Computasters entry comes from teams new to the competition. Some have even awarded themselves exotic competitive titles.

"Perhaps the most striking is from Kalamazoo, which has styled itself the Kalamazoo Superstars before a competitive event has taken place. There's an optimistic note on which to begin your first venture into Computasters!

"Other new entries include the Citibank Shylocks, Sandvic Vikings, Racal, the Reed Group, Microscope and Elstree Computing.

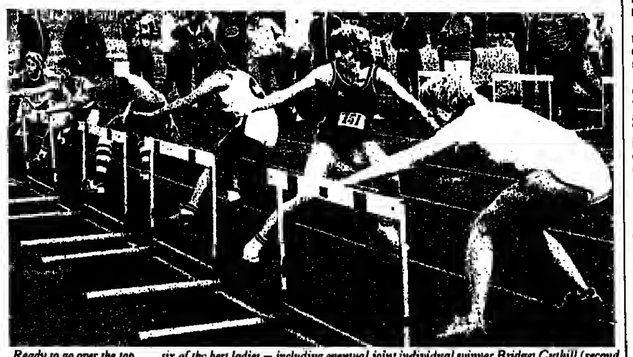
"The most intriguing entry from Computstug takes the form of Kathy's Boys from British Petroleum," he added.

There is early evidence of just how seriously entrants are taking this year's competition, which includes both o domestic and international element.

"Legal and General is entering several of the preliminary heats to help ensure its appearance in the British final — an initiative which is followed by BL, which has entered every facet of the competition."

First of the regional heats will be at Birmingham on April 25, when Midland teams display their prowess. Southern heats will take place at Barnet on May 16 followed by the Northern section at Cleckheaton on June 6.

The British final is scheduled for the New Alexandra Stadium at Perry Barr (Birmingham) on Sunday, July 26, to be followed by an international final in Holland later in the summer.



Ready to go over the top . . . six of the best ladies — including eventual joint individual winner Bridget Cuthill (second left) — prepare for last year's hurdle race at the New Alexandra Stadium, Perry Barr, Birmingham.

Weightlifting

Potential entrants who may be discouraged by the thought that Computasters and Computatug are a glorified Jeux sans Frontières will be heartened to know that all-round competitive standards are very high.

"Last year, we introduced a pistol shooting event into the final", Cairns explained. "Competitors discharged 660 shots of which some 91 per cent were on target.

"The 400 metres hurdles relay gave an average time of 53 seconds per male competitor while the women returned a 66 second average.

"Weightlifting teams also produced some awesome figures. The leading men's team pressed a total of 5.12 tonnes in one minute, the leading competitor raising 2½ tonnes.

"An overall average of over one tonne per competitor shows how high the 1980 standard was. Similarly, the leading women's team raised over 2 tonnes in 30 seconds, while the individual winner recorded a total of 17½ hundredweight.

All last year's winners will compete again. This means that Safe Computing will defend its bureau title while Rowntree Mackintosh seeks to retain the position as best combined men's/women's team.

Rowntree Mockintoah has recorded a unique achievement since Computastars was launched three years ago. "It has been placed in the leading three in each of our three competitions," Cairns explained.

Midland Household Stores and Legal and General are the current best UK and International ladies' and men's team champions. Turning to the individual titleholders, Bridget Cuthill (Legal and General) and Lucy Baines (United Biscuits) hold jointly both the domestic and international trophies.

Those still hovering at the water's edge must submit their applications by February 28 and have worked for their present firm or bureau since February 1. Team entries cost £25 and each team will consist of five members, including a competing captain.

There are running events which will encompass distances up to 800 yards and may include hurdling. The throwing section also has a varied format, comprising flexing one's muscles with a cricket/hockey/basket or netball and a field event-style shot or javelin.

Co-ordination

Kicking includes shooting, converting penalties, dribbling, rugby drop kicks and hockey events for those whose 11-a-side preference is not covered by the two football codes.

Finally, the gymnastic section lays emphasis on the finer aspects of co-ordination, balance and bodily control.

Individual team selection lies in the hands of the playing captain, who must nominate three of his (or her)side to take part at each stage of the Computastars competition.

Computatug is also open both to teams and individual entrants. A team entry costs £5 with an individual "pullet" contributing £2. Once again, potential entrants must have worked for their current firms or bureaux since February 1, 1981.

How do British standards compare with those assessed at international level? Cairns points out that last year's joint women's winner Bridget Cuthill dominated the opposition in the Arran Superstars competition.

"She won against a high class field, furnishing additional proof if it were needed of the level which marks Computastars normal competition experience."

● Follow Kalamazoo's and Citibank's example and fill in the entry forms on the left, posting them to Computastars/Computatug as quickly as possible.

COMPUTASTARS ENTRY FORM

We have read and accept the conditions of entry for the Computastara 1981 competition and would like to enter .....men's teams .....women's teams

Name of team(s).....

Company .....

Address .....

.....

Name of contact for team(s).....

Telephone No ..... Extension .....

Signature of DP manager or equivalent authority .....

Position held .....

The unit would like to compete in the following region: NORTH (Cleckheaton) MIDLANDS (Birmingham) SOUTH (Barnet). Please circle appropriate region.

Enclosed is £..... to cover the entry fees for the team(s) – £25 per team. Cheques payable to COMPUTASTARS LTD.

In all matters relating to the rules or conditions of entry the decision of the organisers is final.

Please send entry form and entry fees to COMPUTATSTARS, 117b High Street, Croydon CR0 1QG. Tel: 01-688 6690

COMPUTATUG ENTRY FORM

We have read and accept the conditions of entry for the Computatug 1981 competition and would like to enter .....men's teams .....women's teams

Name of team/individual .....

Company .....

Address .....

.....

Name of contact for team(s).....

Telephone No ..... Extension .....

Signature of DP manager or equivalent authority.....

Position held .....

The unit would like to compete in the following region: NORTH (Cleckheaton) MIDLANDS (Birmingham) SOUTH (Barnet). Please circle appropriate region.

Enclosed is £..... to cover the entry fees for the team(s) cheques payable to COMPUTASTARS LTD.

In all matters relating to the rules or conditions of entry the decision of the organisers is final.

Please send entry form and entry fees to COMPUTATSTARS, 117b High Street, Croydon CR0 1QG. Tel: 01-688 6690

PRODUCTS

H-P puts text aid on offer

HEWLETT-PACKARD has introduced the HP2601A daisywheel to join the list of peripheral products available for the company's computer systems. The HP2601A produces letter-quality output and is suitable for word processing, text and document applications.

It may prove of use with HP's recently-introduced Text and Document Processing (TDP/3000) software system.

Enhancements that usually require additional applications software are built into the printer and are fully supported by TDP/3000. They include proportional spacing, automatic underlining and centring and right justification, all of which are built into the HP2601A firmware.

Bold and shadow print may be used as highlighting tools to accentuate key phrases in reports produced on the printer.

The HP2601A operates at 32 characters per second with a metal wheel or at 40 chps with a low-cost plastic wheel and each is available in a variety of type styles. Other features include absolute tabs, margin controls, bi-directional printing and reverse paper feed.

Standard issue with the HP2601A is a friction feed platen which may be used both with single sheet and continuous forms. HP also offers bi-directional forms tractors for more precise control over feeding of continuous forms.

THE HP2601A is supplied with an RS-232-C interface which operates with all HP 3000 and 1000 computer systems and with HP terminals, including the 2645, 2647, 2642, 2626 and 2624.

Manufactured for Hewlett-Packard by Diablo Systems Inc, Hayward, California, the HP2601A costs £2,471. The product is covered by HP warranty and HP OEM and volume-end-user discounts apply, with first deliveries expected this month.

Hewlett-Packard Ltd (CW), Computer Systems Group, King Street Lane, Winnersh, Wokingham, Berks. Tel: 0734 784774.

Direct to market

BRITISH distributive arm of the US international company Boles and Co Inc, Boles and Co (UK) Ltd has introduced the Direct VP800B VDU terminal to the UK.

Boles (UK) European operations director Alan Merchant describes the VP800B as "one of the most powerful software-driven terminals currently available and suitable for use in a wide range of data processing applications.

"These include time sharing and data entry — and especially as a major component of word processing systems.

"The VP800B includes at standard a considerable number of features not commonly found on equivalent terminals. For example, it has 32K of memory, double-width and double-sized characters, an 80 character by 24 line or 132 character by 28 line display, smooth scrolling, split screen and a detachable keyboard."

Boles and Co (UK) Ltd (CW), 79A High Street, Esher, Surrey KT10 9QA. Tel: 0372 65461.

Cherry picks

CHERRY has introduced an interactive alphanumeric display system, comprising four basic modular components, usable either individually or as a system.

The modules comprise a 16 or 20-character alphanumeric display, 66-key capacitive keyboard, power supply unit, and a streamlined housing.

Cherry Electrical Products Ltd (CW), Coldharbour Lane, Harpenden, Herts AL5 4UN.

PRODUCTS

Terminal for all seasons

BASED on the latest Olympia electronic daisywheel typewriter, the Datapius input/output terminal is said to offer advantages in the automated office, particulsrly through its ability to print letter quality business correspondence.

The terminal may be linked to all small computers in common office use for word and data processing. Besides providing s computer system with keyboard and typewhcel printer, the terminsl also uperates as a conventional typewriter.

A simple switchover procedure converts it from one method of operation to another. Dataplus Ltd of Cheltenham is launching the product as sole UK distributor for Olympia Business Machines.

The new terminal may meet the need for a business data processing system serving first-time users.

It can operate either manually or in automatic mode to produce letters, stock ledgers, schedules, invoices, forms and other business documents.

Even when word processing is adopted by an organisation, an executive secretary is still required to type some documents conventionally.

Using the Datsplus innovation, the secretary can use the office computer without moving to another workstation and adapting to a new keyboard.

A 96-character daisywheel or typewheel produces sharply contoured printing. The wheels sre interchangeable, different wheels giving a choice of type founts. Either a 10 per inch or 12 per inch pitch can be selected to give a print speed of 20 chps.

Easily exchanged cassettes contain the printer ribbon, the range including multicolour fabric and correctable "cover-up" and "lift off" carbon ribbons plus provision for cutting stencils.

Available from specialist mini and micro computer suppliers, the Dataplus input/output terminal will retail at about £998 plus VAT.

Dataplus Ltd (CW), 39-49 Roman Road, Cheltenham GL51 8QQ. Tel: 0242 30030/37373.

An operational view of Delpa Systems' Video Telex which enables messages to be typed on a VDU in half the time required by an orthodox telex machine. Each Video Telex station costs about £900 and can correct spelling mistakes, delete lines or excise paragraphs.

Delpa Systems (CW), Data Transfers Division, 56 Chiswick High Road, London W4. Tel: 01-995 8301.

Memory supplement

UK market leader in the electronic typewriter field, Olivetti has introduced the ET 231 intelligent memory machine to supplement its existing range. The 231 is designed to bridge the gap separating electric typewriters and basic word processing systems.

The ET 231 incorporates a bi-directional printing facility employing an interchangeable daisywheel printer. Key sections of a script may be emboldened and type styles changed simply by an assembly which houses a 16,000-character (or 8-page) working memory.

British Olivetti (CW), 30 Berkley Square, London W1X 6AH. Tel: 01-629 8807.

Full power in the minimum space

DIGITAL Equipment has introduced the SB11 line, a series of microcomputer-based OEM applications controller systems which will retail at less than £1,000 per unit when purchased in quantity.

The SB11 line is said to combine PDP-11/03 performance with a compact packaging arrangement for controller applications, and is designed for applications requiring full computer power in minimum packaging space.

Typical applications are process or device control, communications and instrumentation. Each SB11 model can be mounted on a tabletop, bolted to a chassis in any orientation, or can be "buried" completely in an OEM's product or system.

Four SB11 models are available, each including the LSI-11/2 (PDP-11/03) central processor, a multifunction memory board with 32 K-bytes of random-access memory, two serial line ports, and a real-time clock.

They also incorporate a memory-resident version of the RT-11 operating system called MRRT-11 (for Memory-Resident RT-11) developed for the SB11 series.

The Standard SB11 enclosure is 12 in x 13 in x 4 in (30.4 cm x 32 cm x 10.1 cm) for all models.

The SB11-AA includes the basic configuration with room for "value added" by OEMs, the SB11-DA is preconfigured to support ten serial lines, the SB11-FA will support seven serial lines including one with modem control and the FA, will accommodate the 488 instrumentation bus three serial lines including modem control.

All four model types are licence for the MRRT-11 ing system software and are able now, prices starting at or £987 in quantities of 5

Digital also announced TU58-VA, a dual-drive DEC II cassette subsystem design complement the SB11. The VA is housed in a small unit identical to the SB11 and signed as a mass storage opti

Digital Equipment Co (CW), Digital House, Ba Road, Reading, Berks. Tel 583555.

An attractively packaged b brawn, the Digital SB11 maximum computer pow minimum space.

Speeding up the flow of invoice handling

ON-the-spot invoicing is now available from Russet Instruments, with the UK introduction of its Syntest SP-314 portable dot matrix printer priced at some £850 per unit.

Manufactured by Syntest in the US, this alphanumeric dot matrix impact printer is aimed at a wide range of mobile and remote applications, such as delivery vehicles, petrol tankers and taxis.

Invoices are said to be produced in seconds — a significant time-saving advantage for both the vehicle operator and driver.

The SP-314 impact printer is powered by a 12 VDC long-life battery and has equal value for field use in marine and other applications.

It is also ideal for communications or computer systems utilising battery back-up such those used in seismic research for remote data logging.

Input connectors are supplied either in serial TTL or RS-232 form and parallel TTL lines can be entered through a 36-way connector on the controller board.

The SP-314 operator can use the built-on-test feature to prints out all ASCII characters plus a sample of graphics.

Russet Instruments Ltd (CW), Unit 1, Nimrod Way, Basingstoke, Berks RG2 0EB. Tel: 868147.

The Russet Instruments' SP 314 has a wide variety of civilian and military applications.

Sponge to 'soak up' data

AS AN adjunct to the Stringy Floppy digital storage device for microcomputers, introduced recently into the UK by MBS Terminals Ltd, the company is marketing the general purpose RS-232 interface called Micro-Sponge produced by the US Exatron Corp.

This is a mass storage subsystem designed for use with minis or micros and has a capacity of up to 500K-bytes. The Micro-Sponge consists of a standard Stringy Floppy drive, a power supply, a microprocessor controller and an RS-232 asynchronous connector.

The Stringy medium is the magnetic tape wound in a continuous loop within a cartridge and the standard drive accommodates with slot for the Floppy wafers.

MBS ... Aldwych House, ... West Drive, ... Tel: 0732 ...

John Cookson argues for trained and specialist computer staffs in secondary schools

'Computer teachers are lacking in basic ideas about software'

RECENT issues of Computer Weekly have raised a number of points about languages and programming techniques to be used in schools, and the machines on which they should be run.

It is worth examining the issues in some depth in view of the controversy which the subject has raised.

School computing had a number of origins. In many cases, local colleges, universities of polytechnics started the process by providing limited batch processing facilities on mainframes. As interactive computing became more widespread, this was supplemented by an online service.

Other schools obtained secondhand equipment from industry and these diverse provisions led to inevitable conflicts and inequalities.

In the case of a batch service provided to a number of schools by a local educational institution, those schools which subscribed early obtained what newcomers considered to be an excessive slice of the allocated resources.

Differences

This was exacerbated further when very limited numbers of terminals for online use became available and a two-tier system evolved comprising schools with online access and others with only batch facilities.

Such differences in opportunity led to less effective teaching in those schools with limited access.

Using equipment provided by local industry did not solve the problem as it meant that standardisation of languages, particularly versions of Basic, in use was not possible.

Schools faced with choosing either obsolete or no industrial equipment took the obvious choice and made good use of what they received.

Incompatibilities between the mainframe machine and the range of obsolete equipment in schools, frequently difficult to maintain, caused other problems for examination candidates.

The microcomputer provided a lifeline for schools suffering from inadequate provision.

Standardisation

Hertfordshire undertook early work on standardising a particular microcomputer under the auspices of the Advisory Unit for Computer-Based Education and a number of authorities followed later with their recommended microcomputers.

It was recognised at the time that technological change could make standardisation problematical. In most cases, the authorities chose CP/M as their operating system on the grounds that it gave access to a wide variety of software and would maximise software portability.

The snag of this approach was that CP/M is wedded to 8080/Z80 8-bit architectures. Basic had been the chosen secondary teaching medium as it was the only high-level language available widely on early microcomputers.

Now it is generally accepted that Basic is inadequate for teaching programming to any student who may need to write more serious programs than elementary programming exercises.

Comal is being hailed as an advance on Basic, an assertion open to question. It is implemented on certain machines and is still in a process of evolution.

The language does not provide the variety of data structures available in Pascal and since all variables are global, Comal suffers from Basic's most fundamental flaw.

Although there is an ad hoc committee in Denmark concerned with standardisation, it is not the subject of any ISO or ANSI co-ordination effort.

Comal is available only on a limited range of machines, most notably the SPC/1 and RC Piccolo computers.

To choose a computer for widespread use as Roy Atherton[1] suggested simply because it supports a particular language — especially a non-standardised, technically flawed language — ignores the major advances in microcomputer operating systems and languages of the last few years.

It has become apparent that the environment in which a language is embedded is as important as the language selected.

Implementation

For example, in the case of Ada there has been a major effort, of the same order as the language design, put into developing the Ada Program Support Environment.

The term environment is used to emphasise that it is a collection of software items, sophisticated editors, compilers and debuggers integrated so as to optimise the program development process.

There are two environments which are portable, widespread and rich enough to be considered; they are the UCSD and Unix systems.

The UCSD system is an obvious choice for single-user school microd. The system is implemented on 6502, 6800/6809, Z80, 8085/8080, PDP-11/LSI-11, GA-16, Western Digital Micro Engine, TI9900, Z8000, MC68,000, 8086, 1802, Alpha Micro 100, Data General Nova and Nanodata QM-1.

Significance of this for schools computing cannot be emphasised too strongly as it means that all Pascal or Fortran programs are portable to the new machine if a school wishes to increase the power of the unit it has selected.

If a school starts with an Apple, for example, it can move up to a more powerful computer without software problems. A mixture of hardware systems can be run together but all students use the same editors, compilers, etc.

Thus, the wide range of hardware supporting a common operating system allows a common software base for schools irrespective of the financial resources they have for computing.

This means that the same system software, educational software, CAL material and examinations in computing can be used sensibly for all schools across a county or even the whole country.

Standardising on a flexible, portable software environment such as the UCSD system means that making educational software available to schools would be easier and providing software could be made highly cost-effective.

A growing number of languages is available in the UCSD environment, notably Ansi-77 Fortran, Pascal and Basic and the UCSD system originators are involved deeply in the Ada compiler writing effort in the US.

Pascal has been used as a teaching language in Continental schools; it is simple, but powerful, modern in design (block-structured), procedure-directed and suited ideally to teaching program design using a structured programming approach.

Disciplined

Most important, using Pascal means that students are encouraged to adopt a natural and disciplined approach to programming. Pascal is used commonly as "pseudocode" for program design purposes.

It is the subject of current international standardisation effort. Pupils using the language are employing a medium relevant to the real world where Pascal is used on a large scale for serious programming projects.

University courses are turning increasingly towards using this language and Ada, the new United States Department of Defence language, is based on Pascal.

Using Pascal provides pupils with a natural progression towards Ada and other powerful computer languages with similar structures which will be central to computing in the late 1980s.

Pascal can be seen to provide a solid foundation for pupils which will be useful throughout their entire programming career.

The major problem faced by computer education is lack of teachers trained adequately in the new technology. A consequence of a policy which simply provides hardware and software for schools will be that facilities will be left idle and money wasted due to the limited numbers of teachers capable of using the computer.

The typical computer studies teacher does not possess a qualification in computer science. He or she is someone who "picked up" computing incidental to maths, physics or something else.

Training

Frequently, the teacher's sole experience is of Basic and Fortran and he or she has little idea of the most fundamental software engineering.

As Dr Oakley[2] said in a recent interview, a national policy on computers in schools is necessary, as is a strong commitment to teacher training. At present, we have two government departments with separate policies, rather than a single national policy. We seem to have made little effective effort so far to attack educational problems arising from the information revolution.

Our contemporary track record gives little confidence that the correct decisions are being made or that the issues are being dealt with intelligently.

1. Keep structured programming simple for schools, Dr Atherton, Computer Weekly, 11/12/80, p19.
2. Beware a basic tool, Tony Oakley, P. Rowe, Computer Weekly, 8/1/81, p13.

Two pairs of eyes eagerly scanning a print-out dealing with the intricacies of organic chemistry. The boys are sixth-formers from Wyggeston School in Leicester who were demonstrating their familiarity with computer techniques in London. They are two of the more fortunate students who have the advantage of up-to-date computer instruction in their school's mathematics department. Their studies include organic chemistry and astronomy.

Contact Xenia White

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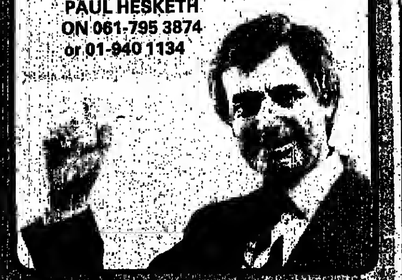

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SOFTWARE SPECIAL – 1

Much attention is focused on software products for minis and even micros, but mainframe products still account for the major part of overall software expenditure. This feature has points of view from ICL, Cincom and Altergo on commercial products for mainframes, and asks an academic where recent developments could take us in the foreseeable future.

Why all OS roads from IBM seem to go the same way

by John Ennever

IN January 1979 IBM's data processing division announced the 4300 machine series, and along with it new releases of most of the existing operating systems.

Initially sales emphasis seemed to be on one of them, the oew DOS/VSE. However, over the last year many IBM customers have been pointed towards VM: either as part of the installed software or, in the case of some oew users, as a total solutioo. It seems appropriate, then, to review the history of the IBM control programs and consider their possible futures.

When IBM introduced the 360 range the intent was to have ooe operating system, OS – The Operating System with three versions: PCP, MVT and MFT. There was a problem in that the smallest of them, PCP, was too large for the small end of the 360 range. So IBM in Germany wrote three smaller control programs – BOS, TOS and DOS.

These were different from OS: they had a different philosophy, different job control language, different layout of storage; in fact IBM had saddled itself with two distinct growth paths from this point on. It would mean two sets of all standard software, utilities, compilers and so on; one for OS and one for DOS. TOS and BOS users began converting to DOS and PCP users to MFT or MVT.

Conversion

With the advent of virtual storage, new versions of the operating systems were announced: DOS/VS and OS/VS1 to replace DOS and MFT; and OS/VS2 to replace MVT (announced a little later).

Several DOS users wished to upgrade their systems and operating facilities, but then found themselves faced with the difficult and expensive conversion to OS. As an aid to these customers IBM pointed to VM, developed earlier oo those of the 360s capable of virtual storage.

VM has the ability of runniog a number of virtual machines and hence several operating systems at the same time. From the oiitset it was designed as an interactive system – its own built-in operating system; CMS (Conversational Monitor System) allows for the interactive development and testing of programs. However, VM was considered simply a cooversion tool, or at best a convenience for systems programmers who might want to test a second system in isolation from the main OS or DOS machine.

As the 1970s passed, OS/VS2 split ioto SVS and MVS. The IBM addressing scheme was limited to 16 megabytes, but with MVS, multiple virtual areas could be supported (something which VM had already achieved by allowing each machine a 16-megabyte address space if required).

Upgraded

In 1979 the 4331 and 4341 machines were announced. OS/VS1 was upgraded to release 7 with practically no new features. SVS was stabilised (that is, discontinued); VM was enhanced to release 6 and many enhancements to it soon followed; DOS/VS was virtually rewritten and announced as DOS/VSE, while no support was offered for MVS on the 4300s at that time.

Since then, much has happened. SVS users have moved to MVS. OS/VS1 users have had almost no new facilities offered them (in the middle of last year some new disc support, but essentially very little else).

There is little aside from a customer's computing background, then, to attract him to VS1 oo a 4300 machine. The 3331a oative disc, the 3310 and 3370, are not supported, the native tape drive, 8809, is not supported, and so oo. It seems that IBM has little interest in developing BS1 and must soon announce its demise.

Where to go?

Then where will the users go, to DOS/VSE?

Curiously, there have been a few VSI to VSE cooversions (just the reverse of what happened six or seveo years ago). DOS/VSE was announced as the native 4300 operating system. VSE along with VM was announced as being easily installed under a SIPO/E (System Implementation Productivity Optioo Extended), a menu-driven package allowing access 10 the system's facilities for Inexperienced users aod performing system programmer tasks on the same basis.

VSE was now clearly an interactive operating system. It was "expected" that VSE users would maintain and test their source programs at terminals using the new DOS products.

VM was there, either as a standalone system or packaged with VSE, but most of the 4300 accounts still seemed to be VSE, with some VS1 on the more powerful 4341.

Not until the announcement of the fourth machine in the 4300 series, the 4341-2, was MVS supported in the range. The smaller 4331s (there were two models now) both fell below the capacity needed for MVS, but IBM felt that both 4341 models were powerful enough.

Meanwhile, early VSE users had had some problems. The SIPO/E installation aid had many flaws and the interactive system ICCF seemed to use an unusually large amount of CPU time. A change seems to have occurred in marketing aims and the advantages of VM were being extolled.

VM has changed over the years and is now much enhanced. Without a guest operating system (VSI, VSE or MVS) it is possible to run most OS or DOS program products. It is CMS which gives VM this facility, and a user may change his machine from one environment to the other with a single command.

Why, then, slave any operating system other than CMS? CMS offers all the facilities of the operating systems on an interactive basis as it was designed to do.

In 1980, VM/SP was released. SP (the System Product) is installed on top of a VM base and gives a much enhanced system. For example, the system Editor, XEDIT, replaces (and is superior to) its predecessor BDGAR; the macro language is much improved; all new devices are supported, and SNA facilities are provided.

What is missing, is the ability to run CICS programs directly under CMS. CICS is IBM's terminal monitor system which runs in OS and DOS configurations.

In fact, the product DMS/CICS, which allows the user to define his CICS screens easily, has its counterpart in DMS/CMS. It seems VM is enhanced, ready and waiting for users to convert to it.

VS1 users may have to choose between upgrading their machine power to cope with MVS, converting to VM, or staying with a stabilised system, as many 360/DOS users have done over the last few years.

DOS/VSE users might be attracted to VM, for the efficiency of CMS and its lower CPU overhead for development fuoctions. There is no doubt also that VM/CMS is by far the easiest of the IBM operating systems to use and learn.

Several new users are already using VM/CMS as their only operating environment and there are indications that IBM expects that if VSB or MVS are to be used, they will be slaves in a virtual machine. For example, DOS/VSE has been enhanced so that it runs without address translation under VM. The 4341 allows both MVS and VM microcode assists to coexist io the machine. (Why offer such a facility if MVS is not expected to run in a VM system?)

For IBM, a move to VM would provide an answer to competitors' interactive control programs, and would take the ground from under the plug compatible software suppliers' feet.

To the user, too, the adoption of VM makes sense. CMS is the ideal type of program development tool.

How will IBM achieve the establishmeot of one operating system which will run on all its 370, 3030 and 4300 machines, and which system will it choose? Only VM is currently supported throughout the range; only VM has the ability to absorb any features of DOS and OS, that customer demand may continue; only VM meets the current state of the art for control programs and could be correctly termed a Hypervisor. Where must DOS users turn if they exceed 12 partitions or 16-megabyte virtual storage? VM!

Another pointer recently was the rumour that the operating environment for the top of the range IBM machine, the 3081, is likely to be VM in nature. Aod lastly, the only operating system capable of easing the conversion to one system is VM, which can provide the old facilities alongside the new. No user with any of IBM's data processing division machines can ignore the development of VM by IBM.

Nor should users be unaware of the grip that this move may give IBM on software revenues. The 4331 with an adaptor based hardware has drawn many first time users to IBM peripherals. It is likely that a move to VM may do the same with software, and enable IBM to control software revenue more closely than it has dooe in the past.

John Ennever is principal lecturer for Altergo Educotion. He joined the company three years ago as a specialist in PL/I and has worked and taught on all IBM large system operating control programs. He is currently developing educational courses based on VM/SP. Altergo runs three IBM 4331 processors each with a different operating system.

Making case for software's independent suppliers

by Terry Booth

AT its annual Million Dollar Awards ceremony in April 1980, International Computer Programs recognised 432 software products as having exceeded $1m in gross sales. Many of the products from independent software suppliers had achieved milestones in gross sales of 20, 30 and 50 million dollars with the top award of $100m going to Cincom's Total Data Base-Management System. In 1971 only 29 software products had achieved the $1m distinction.

The prime case for independent software suppliers is that without them the data processing industry would not have had a range of tools to exploit fully the continuous breakthroughs in the price/performance of computer hardware.

In the Sixties and early Seventies the single supplier concept of acquiring the computer, its peripherals, terminals and software was considered a *raison d'être* for data processing managers everywhere to look to their hardware salesmeo for the provision of the entire box of tricks.

One can understand, to a degree, that earlier philosophy. However, many of today's software decisions, like other investments, must be substantiated by appropriate cost/benefit appraisals and return on investment justification.

With software becoming accepted as a more important investment than the hardware itself there is a swing away from the earlier belief of having one general purpose computer supplier to the healthier trend of using specialist software houses to provido specialist business solutions.

There are several other reasons for this movement away from the single supplier attitude, not least the increased pressure on DP management to deliver computer applications.

Risk

The data processing executive is more accountable than ever to fulfill his project commitments and contribute to the needs of his employer's business. No longer can he merely afford to take the application software package available from the hardware manufacturer if it means having to tailor and change established company methods and procedures to shoehorn the implementation into unsuspecting end user departments. The risk is too great, particularly when he knows that somewhere within the industry the right package for his company almost certainly does exist. In addition, there is an increasing trend by users of IBM, ICL and other computers to seek out and buy high quality system software from independento specifically in the areas of database management, data communications and application productivity tools.

This has produced a bandwagon effect. Independents are now seen as legitimate business partners; the old single supplier arguments of the computer manufacturer are no longer the emotional sales obstacles they used to be.

Between 1970 and 1980 computer hardware price/performance improved by a factor in excess of 200:1 (RPI adjusted). During the same period we have seen huge increases in people costs at all levels of a computer installation. It is inevitable that computer users will demand new ideas and techniques to improve productivity in all aspects of their business, not merely with marginal benefits that most software products have achieved to date, but with completely rethought methodologies to replace many of the sacred cows that have been with us for 20 years or more.

For example, so-called high level languages like Cobol and PL/I were conceived three generations of hardware ago and provide little comfort to the new breed of computer end users.

True value

To appreciate fully the value of the independent software products one has to appreciate also the true value of software itself. The media in the computer industry still pursue their love affair with the hardware business with only a passing fascination with the software industry. Within the next five years software will be accorded its true recognition as the most important entity in the data processing league table. When using the term software I am naturally including the application code within that definition.

Whereas at one time commercial data processing was oriented towardo automated clerical tasks and presenting history information, it has matured in many instances into accepting the key role of providing oporational control systems within the organisotion. The value of such operational control systems should be viewed in context with the current economic climate where a company's competitiveness and service come under closer scrutiny than ever before.

"The organisation which has the best computer system for controlling its business has a distinct competitive edge" may have seemed like a naive statemeut in previous years, but no longer does industry doubt the validity of that statement. Putting to one side the current popular notion of "survival" as the top priority in a list of business objectives, the real objective of those that do survive is to maximise profitability. If one can accept the argument that increased profitability comes from increased productivity then software can help dramatically to achieve that objective. Operational control systems are really fundamental to an organisation's success. They must be built in realistic time scales; they must be changeable; and they must reflect the true needs of the business as seen by the commercial management. However, the growth of the independent software product business is built almost entirely on the fact that hardware suppliers liko ICL and IBM and others have failed in so many areas to provide such help in the form of software tools, productivity aids and software packages to help the hapless end user.

Among his other many pressures the data processing manager has to contend with the knowledge that executives in most organisations now have a higher level of expectation from their data processing departments than, say, five years ago. The management of company areas not traditionally associated with data processing are increasingly looking to the computer for help with specialised applications and personal computing. Even the most competent hardware supplier would be hard-pressed to provide a software solution for every situation. Thousands of computer installations have acquired products from independent software houses simply because the desired facilities have not been available from their hardware vendor.

Terry Booth, UK general manager of Cincom Systems, puts the case for independent software suppliers. Cincom has products for database management, data communications, manufacturing systems and consultancy.

The independent supplier of software is seeking only to sell his software product as a means of meeting his client's needs, often offering compatibility across different manufacturers' hardware and operating systems. The hardware supplier typically has multiple objectives which include maintaining hardware loyalty and if possible generating further demand for additional hardware.

Whereas independent suppliers of system software are aiming towards providing software portability among different hardware manufacturers, the manufacturers themselves have quite a different objective, that of "locking in" the client to the hardware manufacturer and in some cases, to a particular range of equipment.

Even those areas where some manufacturers have adopted an industry common approach to product development such as Codasyl database management systems, they will find that their standardisation claims are not justified. The Codasyl committee may have provided a common set of rules but sadly these rules have been interpreted and implemented differently in most versions. It has not become a standard, is not portable and in any event has not achieved a popular level of acceptability.

Come of age

The independent software sector has done much to further the cause of cost effective computer data processing. Having started life as a cottage industry in the 1960s on the back of the computer revolution the software industry has long since come of age. It will continue to strengthen and grow for as long as discerning computer users demand alternative solutions to those provided by their computer supplier.

In a free marketplace such competition is no bad thing and provides a major benefit to the user community.

The juggernaut rolls on to new and yet more complicated languages

by Tony Davie

THE computer world, especially its academic side, shows no sign of stopping its juggernaut progress towards developing new and yet more complicated languages.

Everyone has a favourite language and the less conservative among us spend much perhaps fruitless time trying to persuade others that our own particular choice should supplant Fortran and Cobol. The trouble is that each language has its quirks, including the two named.

Languages can be classified in a number of ways — for instance, by the data types of the objects they can handle. I classify languages qualitatively into those which have evolved and those that have arrived suddenly by revolution.

Fortran, Cobol and Basic fall into the first category. The process of evolution involves taking a language as it stands and grafting new features to it.

Fortran has encompassed three main stages to date which are sometimes known as Basic Fortran, Fortran, and Fortran 77 and each of these has had an ANSI standard.

Originators

Basic Fortran was in its day perhaps the biggest revolution of all. We shall see below that one of Fortran's chief originators, J. Backus, is still being a revolutionary. Cobol has gone through at least four standards in 1961, 1964, 1965 and 1974.

Basic, too, has had standard versions (at least six "editions") imposed on it by Dartmouth College where the language originated — but no-one takes any notice of those.

I should imagine that there are nearly as many versions of Basic as there are operating systems — indeed some systems give access to more than one version of Basic — and nearly all these versions are incompatible with one another.

Even Pascal, that darling of with-it personal computer buffs, is going to be standardised even though its originator, N. Wirth, and his collaborator wrote such a standard in 1974[1] soon after the language had appeared on the scene in 1971 and after a revised report had been issued in 1972.

A version called UCSD Pascal has practically become a standard in much of the computing community. It seems to me that when a language evolves to a stage where it needs a new standard, the previous grafts it has undergone have not been well thought out, or the root stock is rotten in the first place.

The revolutionary category is somewhat smaller and includes APL, Algol 60 and Algol 68. These have standards imposed by their originators.

They did evolve, but mainly at the research stage and only after much heart-searching by their theoretically-motivated designers.

It is true that both Algols had revised "standard" reports besides originals but these were to clear up minor points.

It is a little difficult to say to which class PL/I belongs. It seems to be evolutionary in the sense that it has taken "features" from just about any other language its designers fancied.

However, it did appear more or less in one chunk. It enjoyed the advantage of having the monolithic might of IBM behind it as a standardising influence.

Revolution

Ada is too young to be viewed properly in perspective. An initial impression is that it stands in the same relation to Pascal as PL/I does to Fortran and it too seems to consist of a large number of ill-considered features.

None of the languages popular today is perfect, especially as a universal medium. It seems that a new language is invented when someone gets dissatisfied with an old one because it is not doing its job properly or because a new feature (such as block structure) has been introduced.

When this happens, we should go back to the beginning and start a revolution; we should not just tack some sticking plaster over the cracks of something basically flawed.

Users with heavy investment in already existing software are bound to disagree but this article is not an argument for getting rid of current compilers and the software written for them.

We must encourage users constantly to try out new languages and operating systems with the long-term objective that they may be able to produce better software with a higher probability of being correct and with less programmer effort. This will pay off handsomely in the end.

When the St Andrews University department made the change from Fortran to Algol, the amount of terminal time used by students went down initially in a dramatic fashion. We were worried that students were not carrying out their projects properly.

On investigation we found that they were getting them correct in a much shorter time and with many fewer Edit-Compile-Run cycles.

Every language has its quirks which are introduced either consciously or unconsciously by the language designers.

One question which springs to mind is whether it is sensible that a mathematician user and an information retrieval user should use the same language.

There must be features useful to one but not the other and it is absurd that these should then both be built into a common language unless they are both of genuine use to both classes of programmer.

A language with features stuck on in this way has been described as "baroque" by Dijkstra[2]. It would appear sensible that we should immediately consider how to reflect the new kinds of thought processes that are involved when a new approach to computers comes along.

Some time ago, computer scientists started thinking about a different way of formulating algorithms. Our whole outlook has been geared historically to the von Neumann view of a computer — as a store, a CPU, and a narrow "bottleneck" connecting them.

This concept of a bottleneck is from an illuminating paper by Backus[3], presented on his being given the Turing Award by the ACM in 1977.

Backus points out that "the task of a program is to change the contents of the store in some major way . . . by pumping single words back and forth through the von Neumann bottleneck . . ."

All this leads us to think about the separation of program entities into, on the one hand, commands which modify the store via the bottleneck, and, on the other, expressions which are merely descriptive, provided they don't have side effects which can only happen if some other command is embedded into them.

It suggests a type of completely definitional method of programming where data structures are described rather than computed by a series of commands.

This kind of programming is known as applicative or functional programming because the data structures are described by applying functions to other data structures.

Because such expressions are totally free of side effects they can be computed in any order and in particular parallel execution can come into its own.

Consider the expression:

complicatedexpr1
+ complicatedexpr2

Provided that the complicated expressions are guaranteed nor to have any side effects, they can be evaluated in parallel or in any order that suits the efficiency of the controlling systero.

Languages are needed in which the entities involved are pure expressions and a number of applicative languages are being and have been developed. They turn out to be powerful and concise.

One particular example, SASL[4] (St Andrews Static Language) is so succinct that its syntax can be defined on half a quarto page which makes it easy to use.

Inefficiency

Its notable lack of features and orthogonal nature make it pleasant to program in, though newcomers from conventional programming find it a little strange at first.

We are now entering a stage where actual non-von Neumann hardware is being researched and built to implement these languages. Until recently, such machines had to be modelled on von Neumann hardware and were painfully inefficient.

It is my contention that we will not stop developing languages tomorrow, and getting the design of a language right is fundamental to the way a whole community of programmers has to work.

Tony Davie, of the Department of Computational Science at the University of St Andrews, asks why there is such a profusion of languages. He looks at some features of a type of programming which is only just beginning to make an appearance beyond the Groves of Academe. Davie is co-author of a forthcoming book on Recursive Descent Compiling.

1 *"Pascal User Manual and Report"* K. Jensen and N. Wirth. Springer Verlag 1974.

2 *"The Humble Programmer"* E. W. Dijkstra. Communications of the ACM, Vol. 15 No. 10.

3 *"Can Programming be Liberated from the von Neumann Style? A Functional Style and Its Algebra of Programs"* J. Backus. Communications of the ACM, Vol. 21 No. 8.

4 *"SASL Language Manual"*, D. A. Turner. University of St Andrews Department of Computational Science Report CS/75/1.

Packaged software top ten

Seller	Country	UK Revenue $M		Country	Europe income $M
Cincom	US	3	Cincom	US	9.5
Hoskyns	UK	3	Computer Assoc	US	8.2
Peterborough DPS	UK	3	ADR	US	8.15
Package Progs	UK	2.77	Software Ag	GDR	7.4
Informatics	US	2.3	Informatics	US	7
Allergo	UK	1.83	ADVOrga	GDR	6.36
[illegible]	UK	1.7	Allergo	UK	5.12
[illegible]	GDR	1.5	Pansophic	US	5.5
[illegible]	US	1.2	[illegible]	[illegible]	[illegible]
Pansophic	US	1.3	BDI	US	5

THE Top Ten in packaged software revenues on both sides of the Channel. The companies predominate in the $350 million European market with 60% of the top slots in revenue terms. Allergo, the only UK company to have achieved a ranking among the rest of the Europeans, is there largely due to the success of its Satchwell Sigma processing minicomputer.

Looking towards the coming together of relational and Codasyl

by Graham Brown

ICL's connection with database software came about through its involvement in manufacturing industry. Database software developed primarily in response to the "parts explosion" problem and other complications involved in translating requirements for finished assemblies into components and shop floor operations needed to make them.

This was how NIMMS and PLUTO were developed for 1900. Similarly, DBMS was developed for System 4. These were sound products in their time and taught some important lessons. One was that the whole software development process could be expedited by means of a database. This is how ICL came to appreciate the need for a data dictionary-system oriented to the needs of the system designer – a more demanding requirement than a mere aid to file rationalisation and tidying.

There was a debate during the 1970s between the relational and Codasyl approaches to database backed by the academic community on the one hand and the data processing world on the other. The issue was between simplicity and support of query languages versus the need for systems which could be tuned readily to give acceptable performances.

Productivity

There was a good deal of emphasis on managerial benefits of data integration in a database as a means of securing greater overall control of the organisation. With the passage of time more modest objectives have emerged.

These are of direct benefit to the data processing department. The real benefits are seen today in terms of increased programmer productivity together with the ability to provide many access paths.

Although organisation-wide integration has proved unmanageable, integration over substantial groups of applications has been possible.

ICL has been involved in both the relational and Codasyl approaches. Just after 2900 series design began in 1971, ICL joined the Codasyl committees and contributed to their specifications. These became an important input to the data management architecture for the series.

A top-down approach was adopted to the provision of a range of data management system products. At the highest level, there is a data dictionary system.

This is an invaluable tool for designing any organisation's data processing – whether by hand or computer, batch- or transaction-based. It can be regarded as a meta-database, describing other databases and the associated procedures.

Documentation

DDS has also established its value as a general data administration tool for system designers and for business administrators and it has over 100 current users.

In the IDMS context, DDS provides the means of generating the schemas defining database structure and the subschemas which interface Cobol and Fortran programs to the database.

DDS also provides documentation for the system and the business in which the system is embedded. For the future, ICL intends to support many of its system products by DDS, which provides a framework for the development of all forms of information processing.

Below this level there are two main products, IDMS and TPMS. These have been designed to work together using straightforward interfaces so that the application programs running in the Transaction Processing Management System can easily access the IDMS database.

Development

IDMS is the Integrated Data Management System which ICL acquired from Cullinane Corp in 1975. At that time, it had laid the foundations for what has since become a formidable reputation in the database field.

IDMS allows records to be stored within a network structure that offers the most general method of data representation, allowing the database structure to reflect that of the application.

It also provides an independent means whereby the user can control records so as to optimise placement and two alternative placement modes are provided.

One uses a randomising algorithm analogous to the "hashed random" access method and the other allows records to be placed as close as possible to a preferred set owner in the database structure.

The Cobol programmers interface to the database structure and access to records from his program are in the form of extensions to Cobol in the Codasyl style.

The TPMS user can use this mechanism, specifying the details of the database he is to access by means of parameters in his TP parameter file. TPMS also [illegible] after the necessary IDMS [illegible] sation for him.

The most recent addition to ICL's database products is the Personal Data System. Andrew Hunt has applied to run an relational database system at Southampton University and enable many more people to use databases without the help of experts.

His system exploits [illegible] principles to provide a [illegible] means of manipulating data in a form directly relevant to people's ordinary thinking and day-to-day data.

Another internal development ICL has been the system CAFS to the implementation high performance relational database.

It is in regular use at ICL for personnel records and payroll data. It points the way to [illegible] in which microelectronic processing of retrieval [illegible] ables the flexible relational approach to be provided with high performance [illegible] many applications.

At present, ICL's Cobol relational systems are seen as complementary. Cobol provides a high performance database facilities to support efficient shared online and batch working. Relational systems provide ease-to-use data bases with [illegible] support for query languages.

Future requirements in distributed database systems are [illegible] proved performance [illegible] hardware development indicates that the systems to converge, [illegible] bling the structure and operation of database systems to be [illegible] fied without compromising performance.

Graham Brown was [illegible] ICL's product development [illegible] Bracknell. In this article he traces his company's involvement in database [illegible] and reviews its current commitment to both the Codasyl and relational approaches which are for ICL, in its "essentially complementary" [illegible]

Appointments

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Is there light at the end of the tunnel? Is the recession beginning to ease? Well, maybe. Our business is computer staff recruitment, not economic prediction, but... we have numerous vacancies in SALES, DP CONSULTANCIES and, of course, in the MIDDLE EAST, and in our experience when there are vacancies for these jobs, others soon follow. So contact us today - be ready for the upturn.

Systems Analyst – Croydon – Package c£12,000 1
Leading insurance company, with a dual 4331 installation using CICS, needs a systems analyst to work in project teams covering a full range of life assurance, investment and accounting systems. Experience must include systems development from feasibility to implementation. A programming background is preferred, life assurance experience, although useful, is not a requirement.

Engineers UK & Overseas £6–15K 2
Minis – *Engineers with minimum 2 years experience required for demanding manufacturer – vacancies throughout London area – salaries to £10K.*
Peripherals – *Major P/C manufacturer needs engineers with large systems experience to support their comprehensive range of discs, tapes, memories + printers. Excellent package with salaries to £11K.*
Peripherals – *Reading based company needs good disc and tape experience to component level – salary to £6–7K.*
Bahrain – *CMC Reality engineer required for installation and support work. Accommodation, car + v.high salary.*

DOS Ops Supervisor – W.3. – to £9,500 3
An IBM 3031 installation currently running under DOS/VS but upgrading to VSE and VM needs an Operations Supervisor to take control of operations, support and job control departments, consisting of 20 staff. In depth knowledge of DOS/VS and CICS is required plus previous operations supervisory experience. Training in VSE and VM will be provided if necessary.

FORTRAN Analyst/Prog – City – to £9,500 4
Ideally experience with financial systems or working with timesharing bureaux, to work in development and client support for a systems company specialising in international banking and investment.

Analyst/Programmer – Middx – to £9,500 5
For revision of current Production Control system using Database. 2 years ICL COBOL and 1 year Analysis minimum requirement. New machine in 1981.

Salespeople – UK – £12,000–£20,000 +
Word Processing – *Experienced salespeople, London and provinces. Basic + Car + Commission + Special Bonus = £20,000 +.*
Micros and Bureau Services – *Good sales record and business skills, target earnings £15,000, basic about £7,600 – East Midlands.*
Software Products – *Systems software houses require junior and experienced salespeople. Basic £5,000, target £8,500–£15,000 +.* 6

Programmers – Middle East – £12K + Tax Free
CMC Reality, HP1000 Fortran, or similar mini systems experience is urgently required in Bahrain and throughout the Middle East. Our clients, all large successful companies, need people now to undertake a variety of interesting projects. All usual benefits are provided including accommodation and excellent tax free salaries. 7

VM/VSI Systems Progs – Croydon – to £13,000 pkg
Financial organisation, installing a 4341 network has several vacancies – excellent salaries, fringe benefits and conditions. 8

CAPP ASSOCIATES
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Capp House, 96 South End, Croydon CR9 3SD
Computer and Professional Consultants

Golf at the Gulf!

Plus up to **£21,500 after tax** *and a substantial benefits package.*

Technical Hardware and Software Evaluators

You will be mainly responsible for the evaluation of hardware and software requirements and/or making recommendations to management. This will involve you in the development of long range plans, within the overall business plan, and include capacity audits, studies and advice on options. More specifically this will entail such areas as physical planning, electrical supplies, cabling, software product evaluation or capacity auditing.

You should have a degree and three years IBM experience.

Standards and Procedure Writers

The job calls for the development of corporate data processing standards for programming languages and practices, applications documentation, systems analysis techniques, JCL, TSO usage, local variations etc.

You should have worked in a large IBM systems environment and have a proven track record in technical writing.

A degree or similar qualification would be advantageous.

EDP Instructors and Lecturers

You will be involved in the training of programmers and analysts in live classroom situations using on-line LLS courses and Deltak Videotape courses. The subject areas will be on JCL, TSO, Mark IV PLI and IMS/VS.

You should be familiar with large IBM systems and associated software and have experience of working in a training environment. Ideally you should be educated to degree level.

Benefits package

- up to £21,500 after tax
- secure employment – our client is the largest oil producer in the world
- career opportunities
- heavily subsidised air conditioned accommodation
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Find out more, phone Mike Mead or write to him now.

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ASK SYSTEMS PEOPLE AT HAMBRO LIFE WHAT IS THE KEY ATTRACTION OF THE JOB.

"REAL CHALLENGE WITH JOB VARIETY."

"BEING INVOLVED RIGHT FROM THE START."

Most people in Systems stay with us – over the past 2 years, staff turnover in this department has been less than 3%.

So what is it about Hambro Life that makes Systems people enjoy their job and stay with us? Simply this:

Systems is at the heart of the Company. The initial decision to build the Company's business around flexible computer systems has enabled us to react quickly to market needs. Today, with assets in excess of £1.1 billion, Hambro Life is the largest unit-linked life assurance company in the U.K. In 1980 alone our business grew by another 28%.

Such a rate of growth means that, although our current computer systems have served us well, we are making large scale changes to all our major systems. This includes the development of a completely new life system which will alone take some 280 man years' effort. These changes depend heavily on new technology – including database, on-line systems and word processing.

Our next generation of systems is producing exciting opportunities for rewarding, personal growth at the centre of one of the U.K's most successful companies.

SENIOR CONSULTANTS To £14,800+CAR.
SENIOR SYSTEMS ANALYSTS To £13,100+CAR.

These jobs put you firmly in the front of our business management, sharing responsibility for wide ranging business decisions. You should be under 35 and have at least 5 years' large scale systems experience, including a record of successful implementations. Currently you are likely to be active in consultancy or project leading.

SYSTEMS ANALYSTS To £11,600+CAR.

We need Analysts each with at least 2 years' systems experience including at least one successful major systems implementation.

Realistic salary levels are just one aspect of a whole company philosophy which you'll find refreshingly different. We're young, business-like and work hard to high standards. We give you as much responsibility as you can take and recognise achievement with real rewards.

Our remuneration package is first class with non-contributory pension, free life cover, BUPA, profit sharing and generous assistance with moving to Wiltshire.

For more information and an application form, please call Anita Meech on Swindon (0793) 27812 (24 hour Ansaphone), or return the coupon to her at Hambro Life Assurance Limited, Hambro Life Centre, Station Road, Swindon, Wiltshire.

PLEASE SEND ME YOUR SYSTEMS RECRUITMENT BROCHURE AND APPLICATION FORM.

NAME .....

ADDRESS .....

.....

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HAMBRO LIFE
THIS IS WHERE YOU GET ON

datascene

Analyst/Programmers
MINI HARDWARE

BERKS. £8,500
Our client is an International manufacturer within the computer industry. They are seeking to fill two positions and require that applicants possess a good knowledge of COBOL and should be familiar with commercial applications in a real-time environment. There is a wide range of company benefits, including a profit sharing scheme paid bi-annually, a half month's salary pre-Christmas payment, plus a substantial company package for the right people. R.4982

Analyst/Programmers & Programmers
HONEYWELL

S.W. LONDON £7,500-£10,500
A leading manufacturing company require two experienced Senior Analyst/Programmers, one Analyst Programmer and one Programmer to complement their existing team. Experience required ranges from 2/5 years of on-line working with COBOL. A sound knowledge of commercial application and project management will be advantageous to those applicants applying for the senior positions offered. The company benefits include five weeks' holiday, product discount, subsidised canteen and Pension Scheme after one year's employment. R.8013

Basic+/Basic+2 Programmers

CITY £7,500
We are in contact with three banks in the City who are seeking programmers with upwards of eighteen months' experience in BASIC +, BASIC + 2, or AIMS. Successful applicants can expect to be working in a batch and real-time environment on applications such as foreign exchange and eurobonds. Opportunities for career progression are excellent and the employment packages offered are without equal. R. GEN

Analyst

HERTS. c. to £9,000
IBM
Our client is well-established and has a recognised name in the food industry. The company seeks analysts with ideally a broad experience of business to work on their IBM 4341 machine.
Candidates should have a good programming background with a realistic commercial outlook rather than be simply analysts. A total of 4 years' experience of data processing is expected.
In addition to a good salary, the company offers 23-25 days' annual leave and a staff purchases scheme. D.8012

RPG II Analyst Programmers
IBM SYS. 32, 34, 38

LONDON CITY to £10,000
An excellent opportunity has arisen for experienced Analyst Programmers to progress into consultancy. Ideally you will have at least three years' IBM-RPG II experience, one of which should involve systems work.
Applications will revolve around banking and insurance projects and will include database, communications and financial planning and modelling.
Applicants must be of smart appearance and have been educated to A-level standard. An excellent benefit package is offered and futuristically will include a car. M.4726

Programmers
IBM 370 and 4331

MIDDLESEX to £9,000 + BONUS
A finance company in Middlesex urgently require IBM Programmers to complement their existing team.
A minimum of 6 months' experience is required although candidates will preferably have some 2 years. In either case experience of CICS is essential. A knowledge of DLI and financial applications would be advantageous.
In return they offer salaries of £9,000 together with a bonus, free BUPA, non-contributory pension and life assurance and luncheon vouchers. D.4929

Analysts and Programmers
ICL 2900

SURREY to £9,000
A leading insurance company in a pleasant Surrey environment seeks both Analysts and Programmers for their 2900 machines.
Applicants should have a wide knowledge of 2900 machinery with preferably experience of insurance or pension applications.
Salaries of up to £9,000 are supplemented by a wide variety of financial benefits which includes a mortgage subsidy after an introductory period. The situation is within 3 minutes' of the main-line station. D.4654

Programmers
ICL 2900 and IBM CICS

CENTRAL LONDON to £8,000 + BONUS
Our clients are a fast expanding software house in the West End.
They need COBOL programmers for both ICL and IBM machinery for a variety of projects.
Candidates should have a degree or its equivalent and between 1 and 4 years' experience of either or both of 2900 and IBM CICS. Knowledge of PLAN will be useful.
Salaries of up to £8,000 are offered with a realistic chance of an additional £1,000 bonus.
The above vacancies are only a small selection from those currently on our files and we are always delighted to talk to experienced systems and programming staff wishing to further their careers. Ref: 7

Datascene International Limited,
Sceptre House,
169-173 Regent Street,
London W1R 7FB. Telex: 28581.

01-439 7871
24 hour answer phone

MODUS

Modus Management Services Ltd
148 Watling Street, Radlett,
Hertfordshire, WD7 7JU

International Personnel Consultants

Telephone: Radlett (09276) 3077

CSC

COMPUTER SCIENCES COMPANY

Computer Sciences, now in its twentieth year of operation, is the largest hardware independent information sciences company in the world.

The services CSC provides cover every aspect of computer technology: from requirements analysis to the design and implementation of large real-time information systems (particularly command and control); from the design and development of many different compilers to the development of complete operating systems for a number of computers; to the design of data communications networks.

The company has personnel resources of over 15,000 employees located in over 100 offices worldwide and also owns its own remote processing service, INFONET.

CSC UK was formed in 1969 and is perhaps best known for the development of large projects such as the London Airport EDP Scheme (LACES) and the Royal Navy's Command, Control and Information System (OPCON).

Towards the end of last year the company was awarded a number of similar projects, as a result of which several extremely interesting and challenging positions have been created. These are urgently required to be filled and applications are therefore invited from candidates who feel they fit one of the following categories:—

Systems Design Consultants
£11,500-£17,000 depending on experience

The salary range above clearly indicates that these positions offer tremendous scope to good people. We will expect to see extensive large systems design experience, thorough understanding of how database and on-line systems are built and co-ordinated and — most importantly — evidence of being capable of working from the higher conceptual levels down to detailed design, on large projects.

At least one of the positions available requires extensive knowledge of ICL 2900 hardware and IDMS and associated software, whilst Data Analysis (or similar) skills are essential from all candidates.

Comms Software Designers
£10,000-£13,500 depending on experience

We seek talented senior team members, people who can conceive and design networks incorporating packet switching, voice and data, transmission etc. etc. Software expertise is a vital ingredient in the equation, so experience of software modelling, software package enhancement or amendments must be present.

An important point to note is that pure specialists in comms or telecomms will not be suitable. Certainly communications knowledge is of primary importance but individuals must have a broad and comprehensive view of systems design and therefore be capable of ensuring that the communications side of a large distributed system is properly designed and implemented.

The quoted salaries are at the top end of the normally available 'market rates' and reflect the fact that CSC is a highly professional and reputable company. Naturally, benefits are in line with this and include BUPA, company pension scheme and a car leasing scheme for senior staff. Season ticket loans are also available and are interest free and relocation expenses can be made available if appropriate.

Contact: Andy Wright or Mike Creamer at Modus or K. R. Barge on 01-439 4511

FOR A TOP JOB IN DATA PROCESSING YOU ONLY HAVE TO KNOW WHO TO ASK!

Ever had the feeling that your career is slipping from under you? (No doubt you put it down to the current ice-age of recession.) Well, in one deft move, you could find yourself back in an environment of certainty, growth – and future. You could also find yourself earning up to £15,000 and a car!

Get in touch with Hambro Life.

But first of all you should know a thing or two about us:

The Company began operating in 1971, and by the end of that year assets totalled around £30 million. From the start, we were totally committed to computerised systems.

Result in 1981:

Hambro Life is the largest unit-linked assurance company in the U.K., with assets in excess of £1.1 billion. In fact, in 1980 we notched up a phenomenal growth in assets of 28%.

Our integrated systems have now entered Phase 3, while the current configuration is a 3033N (4MB) and a 3031.

From this you may assume that our Data Processing Division is very large, very exciting, full of career potential – right to the top. Your progress and rewards are based on your performance. The company itself is young with an average age of 28 in the Programming Department.

So if that gives you some idea of why Hambro Life is the company to work for, we can now move on to your job.

We need to expand our technology biased areas with talented people who have a proven track record of excellence and potential to grow.

The areas of expertise that interest us include:

IMS DB/DC software
database and data administration
computer systems design especially on-line systems
hardware capacity planning and management
DP training and career development planning
project management
people management

We pride ourselves on effectively utilising the expertise each individual offers and on building jobs around that expertise – providing career prospects for all our people in every area of D.P.

We will be offering jobs at two levels:

Jobs like Chief Technical Designer and Chief Programmer offer starting salaries up to £15,000 plus a company car with all running expenses. For Senior Technical Designers and Senior Programming Consultants, salaries will be up to £13,000 plus company car and all running expenses. The D.P. Divisional Trainer we need could be at either level.

In addition to these top salaries, we are also offering a non-contributory pension, free life cover, profit sharing scheme, BUPA, and a generous relocation package for your move to Wiltshire.

For full details and an application form, either send the relevant coupon to Anita Meech, at Hambro Life Assurance Limited, Hambro Life Centre, Station Road, Swindon, Wiltshire or call her on Swindon (0793) 27812, (24 hour Ansaphone service).

HAMBRO LIFE
THRIVING NOT SURVIVING

I'VE HEARD PROGRAMMING IS DIFFERENT AT HAMBRO LIFE. TELL ME HOW MUCH?
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CW/19

I LIKE PEOPLE AS MUCH AS PROGRAMMING – COULD I BE YOUR D.P. TRAINER?
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ADDRESS.....
.....
CW/19

I'M AN IMS EXPERT. WHAT HAS HAMBRO GOT TO OFFER TECHNICAL SPECIALISTS?
NAME.....
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I'M GOOD AT DESIGNING COMPUTER SYSTEMS AND I'M ASKING...
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MYRIAD

BUSINESS SYSTEMS ANALYST

INTERNATIONAL PAYROLL & PERSONNEL SYSTEMS

BASED LONDON W6 TO £13,500

A highly successful engineering construction organisation now wish to recruit a Business Analyst to join the development of a major new project co-ordinating multinational requirements.

The person appointed will become a key member of a broad based project team and will be the computing specialist in the areas of Payroll and Personnel applications.

The International nature of the project dictates that the person will need to be mature and capable of consultation and liaison with Senior User Management in the U.K. and overseas offices, to ensure the successful co-ordination of development and implementation of the system.

Candidates will be required to offer substantial relevant applications experience in addition to a successful background of data processing project development. The role will require the person to develop the business specifications for the U.K. and overseas locations and thence travel to the U.S.A. for a short period to help produce the corporate systems specification. Subsequent short term travel may be required to implement the system.

Data Processing plays a major part in the business activities of the company and therefore career prospects in both the U.K. and overseas are very attractive. An excellent range of employee benefits are offered in addition to the very competitive commencing salary.

REF: NW1/1902

SYSTEMS ANALYSTS £8,500-£10,500
PROGRAMMERS £7,000-£9,000

HANTS
Our client requires both Programmers and Systems Analysts for their main Computer Centre servicing user requirements throughout the U.K.
Developing systems for financially based applications offers job interest and the opportunity of working on IBM 4300 equipment using CICS for on-line systems development.

SYSTEMS ANALYSTS: Must have been involved in the design, specification and successful implementation of a significant commercial project and be able to relate confidently to user personnel.

and PROGRAMMERS: Will need to display a professional approach in developing COBOL or ASSEMBLER programs and have the drive to move into a user contact role.

Our CLIENTS can offer a technically stimulating environment using some of the most up to date computing facilities available. A full range of benefits including relocation assistance support these opportunities in an environment where personal contribution is recognised in a progressive installation.

Ref: RS 1902/1

ANALYSTS & PROGRAMMERS

BERKSHIRE £7,000-£11,500

Our client is seeking additional systems and programming personnel to join and enhance their development teams working on a full range of new systems covering marketing, financial and production applications.
The installation uses IBM hardware with database and on-line systems. Experience of a similar environment will be advantageous although in some positions this is not imperative.
The successful candidates will be offered the opportunity to work in pleasant surroundings in an interesting environment using the latest IBM hardware and software techniques. Career development is encouraged and full technical training will be provided where necessary.
Telephone Myriad on 01-353 0981 to discuss these positions in detail.

Ref: HN2/1902/CW

COULD YOU BE A RECRUITMENT CONSULTANT?

CITY £7,500-£9,000

We wish to appoint an additional two recruitment consultants within the Myriad organisation following the expansion of our City office.
Applicants will be interested in business matters, keen to develop management skills in a position offering job satisfaction, high rewards and the opportunity of developing personality and expertise in the computer industry. Dealing with people, developing relationships and understanding client requirements will be a major aspect of the work, involving communications and computing skills!
Under 27 years of age you should be well-educated with either programming or analysis experience gained in a commercial environment. An awareness of business gained in a Contract role would be particularly relevant. In addition to a confident and outwardgoing personality the ability to work on your own initiative is a key requirement and the potential to grow with the company is of prime importance.
These positions offer a first year salary in the range £7,500-£9,000 and substantially higher rewards will be achievable following comprehensive training during the first year of appointment. The Company offers a professional approach to computing issues resulting in a high competitive spirit and united commitment to growth.

Ref: AW1/1902

MYRIAD APPOINTMENTS
30 Fleet Street London EC4Y 1AA Telephone 01-353 0981 24 hours

Holland

A highly respected Systems Consultancy based in Holland requires experienced **Dutch**-speaking personnel to maintain and develop new business. This successful Company which is part of one of the world's largest Independent computer systems consultancies, has a solid and reputable client base covering all aspects of computing. They are interested in attracting the following personnel:

(1) Senior Systems Analyst/Project Leader with ten years in commercial computing. Experience in Database System and Cobol is essential.
(2) Senior Database Consultant must have In-depth expertise of Database Development (preferably I.D.M.S.) and ON-LINE applications.
(3) Senior Analyst 6-10 years' commercial design encompassing Database Systems and Cobol.
(4) Programmer/Analyst, with a solid Cobol background with exposure to Transaction Processing and Database Systems.

It is important that applicants are adeptable, articulate, neat in presentation and possess a high degree of technical competence. This is a highly reputable organisation implementing top level management for many years.
For further details please contact Eddie Howard.

Avionics — Scientific Programmers

LONDON/HOME COUNTIES/SOUTH
SALARIES £6,000-£12,000

We have a large number of openings for people with scientific or avionics expertise. These opportunities are wide and varied and some involve a proportion of overseas travel. Candidates should hold a degree in a scientific discipline and have experience in some of the following areas:

SOFTWARE DESIGN ★ REAL TIME MINI/MICRO SYSTEMS ★ AVIONICS AND DEFENCE SYSTEMS ★ ASSEMBLY LEVEL LANGUAGES ★ FLIGHT SIMULATION ★ MATHEMATICAL MODELLING.

These appointments are placed throughout the above locations and all are with reputable established companies. In some cases a company car is provided.

For further details please contact Eddie Howard.

Mini Based High Technology Software Engineering

Hertfordshire

Automation Systems, part of Kent Process Ltd., are a young dynamic, company specialising in computer based Process Control and Telemetry systems. Based in Hitchin, Hertfordshire, with customers throughout the world, they are continuing to develop their sophisticated ranges of systems and consequently require additional key personnel with expertise in any of the following areas:

★ Process Control/Telemetry
★ Software Systems
★ Real-time Applications.
★ Technical/Systems Programming.

This is an excellent opportunity to team up with a highly successful company who are still young enough to recognise and appreciate dedication and determination. Career opportunities are excellent offering variety and scope on projects in the UK and occasionally overseas.

For further information please contact Eddie Howard.

Systems Programmers and Technical Authors

UK and Overseas

Here is an excellent opportunity for technically minded individuals with an interest in either systems programming or technical writing. A leading computer manufacturer is now recruiting additional personnel to meet the demands of a rapidly expanding section of the industry. PROGRAMMERS with a minimum of two years' technical experience will be involved in a variety of projects ranging from software design and development through to final testing and implementation prior to general release.

TECHNICAL AUTHORS with some previous experience in the production of technical specifications and software manuals will be required to work in close association with both software design and product test teams. Applicants should be prepared to tackle and solve all manner of problems and maintain a high standard of documentation at every stage. Rapid career advancement is envisaged for those with the right background, qualities and experience.
For further information please contact Eddie Howard.

Edmund Howard & Partners

5 Brighton Road, Surbiton, Surrey, England. Tel: 01 399 9183

(4581)

D.P. Consultants

Central London **to £15,000 + car**

Our client, a prestigious, international management consultancy, wishes to appoint additional Data Processing Consultants for a variety of U.K. and overseas assignments.

Successful applicants will be given the opportunity to broaden their experience by working with senior management on strategic and operational problems over a range of applications, both in U.K. and overseas.

Ideally you will have a good degree, at least 5 years mixed user and technical experience to include programming, analysis, design and installation. Applications experience should include some of the following: order processing, stock control, accounting, production control, banking, insurance and system audit.

Personal qualities of manner, appearance, disposition and communications skills are vital. The preferred age is between 27 and 35 years. Company benefits, including overseas allowances, are generous.

Applications Consultant

Business Systems
Home Counties Border **£10,000 + car**

Our client, a major international supplier of office computer systems, is expanding its support organisation. The Applications Consultant will be responsible for a team of analysts providing a range of pre and post sales support to clients in the U.K. The successful candidate will have a commercial programming background with good client liaison skills.

Applications Analysts **£8,000 + car**

Reporting to the above consultant, you will be involved in providing support for client applications on a growing range of sophisticated electronic office products. You will have 2 or 3 years experience in commercial programming and a healthy attitude to job flexibility and ambition.

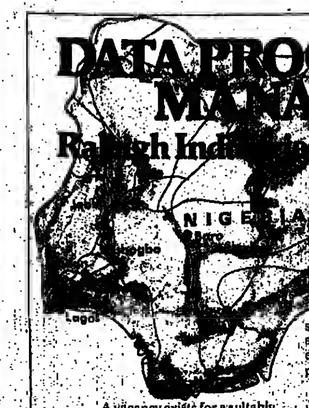
You could not fail to be impressed by the company's range and quality of products.

Apply in confidence to Terry Harvey by sending personal and career details, or contact him for an application form: evenings Gt Missenden (02406) 4715 or daytime as below.

HR Harvey Recruitment
Executive and Computing Personnel Consultants
500 Chesham House, 150 Regent Street,
London W1R 5LA Tel: 01-734 5351

DATA PROCESSING MANAGER

Raleigh Industries (Nigeria) Ltd



A vacancy exists for a suitably qualified Nigerian National to take over the operations and further systems development in an established Data Processing department using an NCR 8270 computer.

The position is based in Northern Nigeria at the modern manufacturing plant of Raleigh Industries (Nigeria) Ltd. The Department provides Data Processing and O & M Services to all operating divisions of the Company.

The successful candidate should be educated to degree level and will have had several years' experience in Data Processing preferably at a senior level.

The remuneration package will be attractive and dependant on experience and qualifications.

Please write to Mr. G. Warby, Management Development Officer, TI Raleigh (Services) Limited, 177 Lenton Boulevard, Nottingham, NG7 2DD, for an application form or telephone Mr. M. Fisher, Systems Manager, on 0602 787761 ext. 115 for further information.

TI RALEIGH

(4580)

JBA

Sales Consultants

Essex / Birmingham **c. £13K + car**

A leading, nationwide bureau organisation, are seeking experienced Sales Executives to contribute significantly to current expansion plans and develop their own customer base. You will be responsible for selling the bureaus wide range of data processing services, including application packages, terminal enquiry facilities and bespoke systems.
Main preferred qualities sought, are a sound understanding of business problems, a proven sales record in a related field, and ideally, a background in accountancy or business systems. Targets are very realistic, and achievable, for salesmen with energy, initiative and the enthusiasm to succeed. **Contact: Brian Postlas**

Systems Manager — Designate

Kent and O/Seas **c. £13,000**

A small but expanding telecommunications systems house require a highly competent technician to take full responsibility for a Command and Control real-time project, with the client site being in North Africa.
You will be working on Data General hardware, with the programming language being Fortran, and your main involvement is developing, installing, commissioning and supporting the total system.
Experience in systems, comms, and applications software, are essential qualities.
Candidates must be prepared to travel overseas though not for extensive periods.
Contact: Brian Postlas

Communications Support

London **£10,000**

The Computer Services Department of this well known organisation, are seeking senior/junior technical expertise in the communications field.
It is essential to have good experience of IBM 3270, SDLC, HDLC, X25 or Package switching.
For the more senior position, a background including communication system design is of utmost importance. A degree or equivalent qualification in Engineering or related subjects is mandatory for both positions. Good prospects and training will be offered.
Contact: Janet Chilvers

Systems Software

South Coast **£10,000**

An internationally recognised electronics company, is at present seeking systems software experience.
It is essential to have at least four years in Software development, with knowledge of support tools, such as compilers, linkers and pre- processors, with a particular emphasis on the UNIX operating system. They also require experienced people in the area of real-time systems with micro processors, including peripheral handlers. Knowledge of word processing applications design would be a definite advantage. **Contact: Janet Chilvers**

Analyst/Programmer

West End **c.£10,000**

Due to continued expansion, a leading film production and distribution company have upgraded their site to an NCR 8430 and so need an experienced Analyst/Programmer to develop certain commercial applications both here and abroad.
Applicants should have at least 4 years experience in COBOL and possess the analytical skills required for a dynamic commercial industry.
Current systems are mainly interactive, so a knowledge of this technology would be beneficial.
The successful candidate will be required to contribute in development at the Paris office and so a working knowledge of French would be an obvious advantage.
Normal large company benefits apply. **Contact: David Hendry**

Mini Systems Analyst/Programmers

London **to £8,500**

Our client, **Scicon Consultancy International** requires Analyst/Programmers to join its **ENERGY SYSTEMS** division, helping to design and develop systems to manage the exploration, supply and use of Energy resources.
Applicants must be self-motivated and should have at least 18 months experience of high-level programming (e.g. COBOL, FORTRAN, PASCAL) on mini-computers. On-line, database expertise would be an advantage.
Successful candidates can expect to work on a variety of challenging projects in a demanding environment, the prospect of rapid promotion to project leading and consultancy roles. **Contact: Margaret Stevens**

Analyst/Programmer

London **c.£8,500**

A well established software house and systems consultancy, are expanding their London office and so have a requirement for analyst/programmers to develop and support turnkey projects based on the T1990 range of computers.
Candidates must have at least 3 yrs. experience in d.p. preferably being gained in a mini environment, coupled with a sound knowledge of COBOL. An understanding, if not a working knowledge of systems in a financial area, would be an added advantage.
Training in the company's products will be given, it is expected that the candidate be self-motivated as this is a responsible position. **Contact: David Hendry**

Programmers — Financial Systems

Rural Hampshire **to £7,500 + Mortg. Subsidy etc.**

A large and expanding insurance Company are currently seeking experienced COBOL programmers to strengthen their project teams involved in development of sophisticated financial systems.
Current configuration includes, Redifon mini and Burroughs B6800 mainframe, incorporating batch systems and on-line testing facilities.
Experience must include 18 months COBOL, not necessarily in a financial institution.
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Please telephone or write for an application form to Mr. R. Martin, Personnel Manager, Brantford International Limited, Regal House, East Street, Barking, Essex, IG11 8EY. Tel: 01-594 7181 ext. 367.

(4534)

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WHAT YOU NEED
An Honours Degree in a scientific or engineering subject or corporate membership of a senior professional institution.
In addition, several years' experience as a user of a large computer system or of providing and supporting a service on such a system is necessary, as well as an understanding of system control languages and high level languages including FORTRAN and COBOL. Experience on an ICL 2900 system using VME/B would be an advantage.

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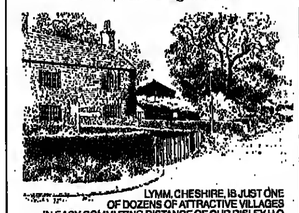

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Salary within a range: **£6171 - £9211** per annum.

Applications quoting reference No. 231/81 and giving full details should be forwarded to:
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Required to co-ordinate activities within the Systems and Programming Section (approx. 25 personnel) whilst reporting directly to the Head of Computing. Applicants should be capable of liaising with Government user Ministries and local and overseas software houses. A knowledge of distributed DP systems and on-line networks is essential.

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Applicants should be highly experienced in project leadership in addition to at least 6 years systems and programming experience with a relevant computing science qualification.
Successful applicants will be responsible for all aspects of new projects, initiation, development, implementation and review. The ability to plan and cost such projects is essential.

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(4541)

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Analyst/Programmer

Wembley c.£8,500p.a.

This young, dynamic Company is in the process of expanding its DP function with the introduction of new applications. We have an IBM 4331 running under DOS/VSE in an on-line environment using CICS.

We now require an Analyst/Programmer with at least 3 years' commercial DP experience which will include programming in IBM COBOL and some involvement with systems analysis and design.

For further details please contact Mike Leaney:

The Leisure Circle Ltd., York House, Empire Way, Wembley, Middx. HA9 0PR (Tel: 01-902 8888)

(4552)

SCIENTIFIC COMPUTING IN LIFE SCIENCE RESEARCH

Computer Scientist

LIFE SCIENCE RESEARCH is one of Europe's largest Contract Biomedical Laboratories, providing an international service in the field of safety evaluation.

Owing to the expansion of our computing facilities we are making additional expertise in scientific computing. Current projects include the development of on-line data capture systems and the implementation of advanced statistical techniques. A new Perkin Elmer computer system is being installed.

Ideally suitable candidates should be in their mid-twenties, with a degree of Computer Science or a related discipline. They should have previous experience in a mini-computer environment and of systems analysis. An in-depth knowledge of scientific programming in at least one high level and one assembler level language is also required.

Salary is negotiable and will reflect our desire to appoint someone with proven ability and considerable potential for further development. Benefits include four weeks paid holiday, flexible hours working system, a staff pension scheme, free BUPA membership, accident insurance and life assurance, an active Sports and Social Club, staff restaurant and subsidised transport. Assistance with relocation expenses, where appropriate.

Our laboratories are situated in attractive countryside on the Norfolk/Suffolk Border midway between Norwich and Ipswich. Housing in the area is relatively inexpensive.

Please write or telephone for an application form to:
Mrs V. C. Clements
Personnel Manager
Life Science Research, Elm Farm Laboratories
Oxold, Nr. Eye, Suffolk IP22 2HX.
Tel: Oxold (03782) 481.

LSR
Life Science Research

Engineer-Analyst

c.£8,500 negotiable HORSHAM, Sussex

Electrowatt Engineering Services is a large international firm of consulting engineers active world-wide in power generation and associated energy supply projects. The UK subsidiary is seeking an additional Engineer-Analyst to participate in varied engineering assignments, many of which have a significant analytical content.

Applicants should have good academic qualifications in either an engineering subject or in mathematics and a strong computational background. About 5 years experience in either a research, analytical support team, or an engineering environment would be suitable. An ability to write and maintain sometimes complex Fortran programs, together with an interest in working within a multi-disciplinary engineering team, are essential.

We are able to offer a professional and stimulating working environment in a very pleasant part of the country. An attractive salary, which will depend upon qualifications and experience, is supplemented by fringe benefits which include a non-contributory pension scheme and a generous holiday entitlement.

Please send a brief summary of qualifications and experience, quoting reference DWAW/16, to:

Electrowatt Engineering Services (London) Ltd.
Grandfield House, 16 Carfax, HORSHAM,
West Sussex RH12 1EB.

BRUNEL UNIVERSITY

DEPARTMENT OF COMPUTER SCIENCE

Following its success last year, the Department is repeating an advanced and intensive course on

COMPILING TECHNIQUES

Do five consecutive Tuesdays: 28 April-26 May.
Lecturer: Professor F. R. A. Hopgood, Head of Computing Division, Rutherford Laboratories and author of Computing Techniques.

Further details of the course may be obtained from The Secretary, Department of Computer Science, Brunel University, Uxbridge, Middx. UB8 3PH. Tel. Uxbridge 37188.

SAUDIA ARABIA

Our Client, Consulting Engineers, urgently require the following personnel for one of their projects in Saudi Arabia. Applicants must be experienced in the following disciplines and have a minimum of 5 years experience in their respective fields:

1. SOFTWARE SPECIALIST
2. COMPUTER SYSTEMS ANALYST
3. COMPUTER SYSTEMS PROGRAMMER
4. DATA BASE SYSTEMS ANALYST
5. DATA COMMUNICATIONS SPECIALIST
6. PETROLEUM PROGRAMMERS
7. COBOL LANGUAGE PROGRAMMERS
8. COMPUTER MAINTENANCE ENGINEERS

For Salaries see CTC 26-1067 P.A. ACCOMMODATION, MEDICAL CARE, etc.

Please Call 01-499 8070
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WALTON ROAD
LONDON, W12

COMPUTER ENGINEERS

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require

4 Senior Systems Engineers

to look after their expanding user base in the London area.

This is a ground floor opportunity for a well trained engineer, with at least knowledge of Honeywell Level 6 software.

We offer a realistic starting salary, company car, private mileage paid, 4 weeks holiday, free life assurance, pension and fringe benefits.

Please contact Cliff Gibbons on 01-237 7991

UNIVERSAL COMPUTERS LIMITED
The Lifeguard Computer Centre
Old Park Road, Enfield, Middlesex

PROGRAMMERS CONTRACTS

SCANDINAVIA 3 months & Renewal
Our Client, a leading Scandinavian Company, requires ANALYST PROGRAMMER, IBM 370/158 multi-frames, and distributed processing experience, for pre-sales support role, dealing mainly with mainframe D.P. staff.
HERTS c.£8 monthly
Two Programmers required, having 2 years' experience, for interesting environment in small friendly team. Assembler experience essential, knowledge of Data would be an asset. To start immediately.

Contact Graeme Jones

TONGE & Computer Services
Tonge Mills, Clayton, Tel: 638 3761

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If you always thought that selling word processing was only one step above selling office equipment, you're wrong. Our client manufactures some of the most sophisticated information processing systems in the business today and with over 2,000 screens installed in the UK alone they dominate the market.

From this position they are about to launch new products expanding not only the range but also the sophistication of applications currently tackled.

To cope with a major expansion in 1981 they have asked us to select high quality experienced sales professionals with an established track record in either data processing or word processing.

The company will offer substantial benefits, not only in terms of its excellent remuneration package but also by providing high profile marketing, excellent pre- and post-sales and technical support, full demonstration facilities.

The career prospects are truly some of the best in the industry.

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MANAGEMENT & EXECUTIVE SELECTION

(4260)

SOFTWARE CONSULTANTS & PROJECT MANAGERS

SALARY CIRCA £11,000 + BENEFITS

STAINES — LUTON

Ideally the Candidates will have experience in the following areas:

- ★ At least two High Level Languages i.e. CORAL, PASCAL, FORTRAN, etc.
- ★ Two years at a reasonably Senior Level with experience of Customer Liaison and Consultant Functions. Also a High Degree of Communicative Skills.
- ★ Sound relevant educational background including a Degree in Maths, Physics, Engineering or Computer Science. And capability to produce the necessary Administrative background and documentation on Projects.
- ★ Typical Company background might well have included MARCONI/PLESSEY/GEC or any of the major motor vehicle manufacturers.

If you feel you can satisfy our client's requirements and would like to be involved in Major Hardware including Hewlett Packard, DEC, GEC as well as Electronics Communications, Robotics and Telemetry, then we can offer you the following:

- ★ Substantial Salary Package. Circa £11,000 including £1,000 p.a. Car Allowance.
- ★ Relocation & Mortgage assistance.
- ★ Private medical scheme (BCWA).
- ★ Very generous pension scheme.

For further information please ring Peter Higgins on 0274 22824 (reverse charge) or send full c.v.

windsor
Recruitment Consultants

Suite 16, West Exchange, Bradford 1

(4697)

LONDON SCHOOL OF HYGIENE & TROPICAL MEDICINE

(University of London)

Keppel Street, Gower Street, London WC1E 7HT
Department of Human Nutrition

PRE-SCHOOL CHILD GROWTH SURVEY

CLERICAL AND DATA PROCESSING ASSISTANT

A clerical officer is required to perform tabulation and data processing duties for a survey of health and growth of pre-school children in Greater London. The work is backed by a grant from the Department of Health and Social Security and is to start in May 1981, and it is hoped to retain the appointment before April, at least up to 1984/85.

The duties will involve co-ordinating and organising the clerical work of the survey, as well as some statistical work. Suitable applicants will have good numerical aptitude, be methodical, accurate and capable of working with minimum supervision.

Salary will be in the range £4,419-£5,862 (under review) according to qualifications and experience. Starting salary will not be above £4,995. Application forms from the Personnel Officer, 01-636 8636 ext. 2242.

THE UNIVERSITY OF MANCHESTER

DEPARTMENT OF COMPUTER SCIENCE

EXPERIMENTAL OFFICER

Applications are invited for this post in the Department of Computer Science. Much of the equipment has been and will continue to be developed in the Department but there is also involvement with the interfacing of bought-in computers ranging from an PDP11 systems, various microprocessors, and a variety of peripheral equipment including display graphics. Candidates should have a degree in Computer Science or some equivalent qualification. Previous experience with computer interfacing would be an advantage but not essential.

Salary range p.a. £5,565-£6,666.

Application forms and further particulars from the Personnel Officer, The University, Manchester M13 9PL, to whom they should be returned as soon as possible. Please quote reference 1/81/CS.

maindec

COMPUTER ENGINEERING

FIELD SERVICE ENGINEERS

Maindec Computer Engineering is one of the fastest-growing engineering service organisations in the U.K. We are currently able to offer a "ground floor" opportunity to service engineers seeking further career development.

Applicants should have experience in the field servicing of PDP-based computer systems and associated peripherals, and be able to assume full responsibility for the servicing of equipment throughout London and the Home Counties. We will look to successful applicants for direct involvement in the company's very rapid development.

The terms offered are a basic salary of up to £10,000 p.a. for suitably qualified applicants, an overtime payment scheme, stand-by, the use of a company estate car, together with a comprehensive benefits package.

Applications to: Maindec Computer Engineering Limited
Unit 14
Wye Industrial Estate
London Road
HIGH WYCOMBE
Bucks.
Tel. High Wycombe (0494) 20449

(4523)

Systems Analysts

c.£16,000 Saudi Arabia

One of the world's most ambitious and important pipeline projects is now nearing completion in Saudi Arabia.

Petroline—The East/West Oil Pipeline will link Saudi Arabia's eastern oilfields with the Red Sea Coast. With the project due to be on-stream by mid-1981, we are now seeking experienced Systems Analysts to take up appointments by May, 1981.

The successful candidates will be required to provide computer support for this major pipeline project, using highly sophisticated equipment and systems. A programming background is desirable, preferably gained in the micro-processor field.

14 month renewable contracts are offered and include:
★ Free food ★ Free accommodation ★ Medical care ★ Recreational facilities ★ 2 weeks leave every 3 months with air fares paid.

For further details please telephone 01-839 8359 or write to our Recruitment Consultants, who regret no calls or interviews can be granted in the U.K. (Please quote ref. PE11).
Astral Recruitment Associates, Astral House, 17/19 Maddox Street, London, W1R 0BY.

(4529)

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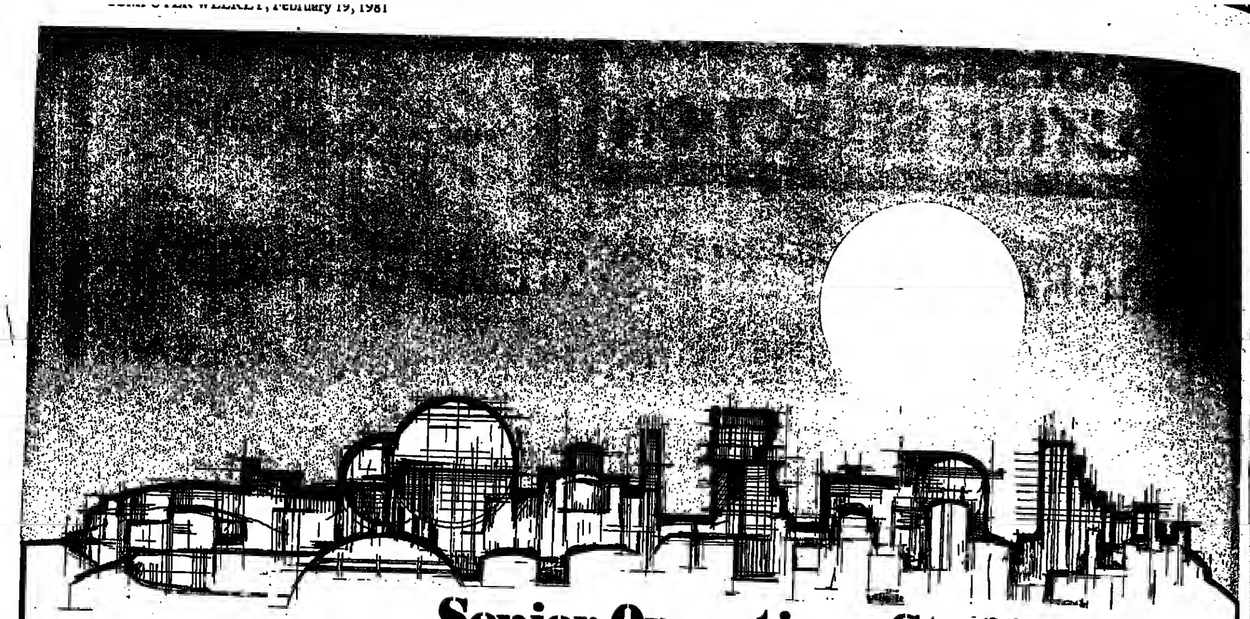

Senior Operations Staff
Software Support Technicians

Saudi Arabian Gulf. Salary from £14·75k up to £21k net.

The exploration and development of further energy sources is still of paramount importance even to the world's largest oil producer. To this end their multi-million dollar investment will create one of the most advanced scientific centres in the world. Obviously computerisation will play a major part, and their computer centre based on the Arabian Gulf will incorporate IBM's 3033AP and 370/168 processors, and other current technology peripherals. They will operate with MVS/JES3, SNA/NCP, NJE, TSO, PL/1, MARK IV. The candidates to be recruited will be accommodated in large residential communities which are entirely company operated, and will be at the forefront of this massive expansion programme. For all positions exposure to large IBM systems (preferably 3033's) is essential and the ideal candidates will have between 3-10 years experience in one of the following areas:

Shift Leader/Console Operators

Shift Leaders/Console Operators with at least 4 years experience of large IBM mainframes. You must have worked on 3033's and 370/168's using MVS-JES 2 or 3, TSO and other software facilities associated with a TP network and Database environment.

Shift Managers

Shift Managers with at least 6 years experience of large IBM mainframes and at least 2 years experience of managing shift teams of up to 8 people. You will be responsible for all aspects of production from the computers and must be able to diagnose and progress any operational problems to a speedy and effective conclusion. Liaison with hardware engineers and support staff will be of the utmost importance and TP Network experience is essential.

Technical Support/Operations Analysts

Technical Support/Operations Analysts with a minimum of 4 years experience in operations support for a large OS/MVS environment. You will be expected to resolve all software and network challenges as well as normal software maintenance to keep the configuration running as efficiently and effectively as possible.

Software Programmers

Software Programmers with at least 3 years MVS experience incorporating either IMS DB/DC or teleprocessing systems.

The successful applicants should have a sound educational background and will be offered indefinite term contracts, initially on single status and can expect generous holidays, free medical treatment, subsidised accommodation and repatriation flights as part of a package that must compare with the best in the Middle East.
Company interviews will be held in London in the first week of March, so contact Keith Rowland now on 01-836 8411 (reversing charges) for further information.

CoOperators Overseas Recruitment Division
VLI House 68-69 St Martin's Lane London WC2N 4JS Telephone 01-836 8411
Recruiting for Clients worldwide

MANAGEMENT & EXECUTIVE SELECTION

telephone 01-637 9611
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PROGRAMMERS

LONDON to £9K

Expand your knowledge by programming in an environment where database and distributed processing technology are vital aspects of the company's growth.

This installation uses IBM 370/158s as the centre of a sophisticated teleprocessing network covering the UK and reaching areas of Europe. On-line, real-time systems incorporating database techniques are currently being developed for use in the 80s.

If you have more than 2 years' PL1 experience in an OS or DOS environment then the chance exists to improve your prospects immediately. COBOL programmers will also be considered and obviously database experience is preferable but not essential.

The benefits are great, the prospects even better. Please contact Diane Oubridge on 01-637 9611.

SYSTEMS ENGINEERS

to £12K + CAR

To be one of IBM's major competitors you have to be good. That means you have to have good systems, competitive pricing and excellent people. They already have the systems, the pricing and many of the best people, but more people are needed.

Systems programmers with experience of MVS, VM or VS1 are required to support major sites in most areas of the UK.

Our client recognises that frontrunners cannot afford to stand still and neither can you. Contact Diane Oubridge on 01-637 9611.

Suite 201/6 Albany House 324 Regent Street London W1R 5AA 01-637 9611

MANAGEMENT & EXECUTIVE SELECTION

Swiss Life

New Installation

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SENIOR PROGRAMMER

Up to £8,500 + Assisted Mortgage

Swiss Life Insurance and Pension Company wish to recruit a Senior Programmer to take up a key position from the start of their new computer installation.

The person required will probably have a minimum of 3 years' programming experience using ANSI 74 COBOL; preferably gained on Honeywell mainframe equipment.

Knowledge of the GCOS operating system is also desirable but not essential.

Applicants should be under 35 with an outgoing personality allied to an ability to mix at all levels in a growing organisation.

Applications, which will be treated in the strictest confidence, should be sent to:

J. W. Manaton
United Kingdom Manager
SWISS LIFE INSURANCE AND PENSION CO.
99/101 London Road
SEVENOAKS, Kent TN13 1AX

INTERNATIONAL SOFTWARE ANALYST

Must be experienced in assembler language and mini or micro systems. A knowledge of European telephone systems is desirable. Join a development team in the US for 6 to 8 months then return to London where you will provide product support to our marketing staff and technical liaison with the US team. Position directly involves the design of new micro-based products aimed at telephone cost management systems. Excellent salary, rapidly growing US company and outstanding job challenge.

Please send CV to: **Sykes Datatronics Limited**
Regal House, London Road
Twickenham, Middlesex
Telephone: 01-891 4796

EUROPEAN MANAGER

For International Distributor Network

US manufacturer of floppy disc systems with UK headquarters needs experienced Marketing/Sales Manager—background in mini/computers, peripherals or communications equipment. Applicant needs 3/5 years' sales-management background, some outside UK if possible, European language a plus. He will take charge of 10/12 distributors to support marketing, increase sales and coordinate their efforts. Applicant needs good technical background to enable him to support distributors. Some initial training in USA and UK, extensive travel. US company, good basic salary plus incentive bonus based on performance each year.

Please send CV to: **Sykes Datatronics Limited,**
Regal House, London Road
Twickenham, Middlesex.
Telephone: 01-891 4796
891 4796

CAD/CAR TECHNICAL SALES SUPPORT ENGINEER

C. £12,000 p.a.

Must heve knowledge and 'hands on' experience of CAD/CAM systems, preferebly AD2000

Kongsberg, one of Norway's leading and most successful engineering companies, is expanding further into the Computer Aided Design and Manufacture systems with its COM 300 CAD/CAM system based upon the AD 2000 software.

The CAD/CAM Technical Sales Support engineer will be responsible to the UK Sales Manager and will be involved in PRE/POST Sales Support.

This will include: Demonstrations
Bench Marks
Presentations
Advising customers on CAD/CAM
Assisting Sales Engineers in proposals.

Salary is negotiable, depending on experience. The package includes free BUPA and life assurance cover, assistance with relocation if appropriate. Excellent career prospects within the organisations.

Please contact Sheila Cooke on Maidenhead (0628) 20207 for further details

KONGSBERG DATA SYSTEMS
St. Peter's Road
Maidenhead
Berks.

145971

RS COMPONENTS LIMITED
COBOL PROGRAMMER

required by Britain's biggest electronic components distributor, to join a small team working on a Univac 90/30.

Applicants must have at least 1-2 years' experience in Cobol. Knowledge of accounting systems and OS/3 an advantage.

Salary £8,200-£7,200 p.a., depending on experience.

Attractive company benefits include a contributory Pension Scheme and membership of P.P.P.

Please send full career details to:—

Personnel Department
R.S. Components Limited
37-45 City Road, London, E.C.1

or telephone 01-253 1222 for an application form.

No agencies.

145141

Computer Operators – ICL 2900

New Computer Centre

FULHAM, LONDON SW6 up to £7,668 (plus shift allowance)

British Gas are currently expanding their Headquarters Computer Services Department.

Current mainframe computer systems include an ICL 2972.

We need more computer operators with at least two years operating experience on an ICL 2900 (VME/B) machine.

Location: Near Fulham Broadway at our new purpose-built Computer Centre.

Further details: Please phone Barry Baker on 01-736 3344 ext 250 at any time during office hours, or write with full details of age, qualifications and experience, quoting ref SP/766401/CW to the Senior Personnel Officer, British Gas, 59 Bryanston Street, London W1A 2AZ.

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IBM Systems Engineers

W. Germany: Salary to £20K

On behalf of an internationally renowned supplier of DBMS and T.P. Software Products we are seeking several IBM orientated Systems Engineers with extensive knowledge of some of the following products and operating systems: CICS, IMS, MVS, TSO, ENVIRON, TOTAL, IDMS or SHADDW. Technically, you must demonstrate 5 years' continuous exposure to the implementation and/or Support of Data-Base and Teleprocessing Systems in a large or multi-user IBM or Amdahl installation. The Company is offering superb permanent career positions in its new German office and offers higher than average salaries (even by Continental standards). There is a strong preference for those with a working knowledge of German. Ref. L/7/A

Business Consultants

Central London: Salary to £14K

Your past experience in the Data Processing industry has probably given you the ability to identify and solve problems from both a business and technical point-of-view. If you also have good personal communication skills and a strong desire to join a successful and prestigious Management Consultancy, then our client, based in Central London will be very interested to hear from you. Particular requirements are for graduates aged 28 to 34, who can demonstrate extensive practical experience in the areas of Office Automation, Word Processing and Communications Networks. Respondents with specialist expertise in PRESTEL and VIDEOTEX applications are especially welcome to apply. Ref. L/7/B

Real-Time Applications

German Speaking: Salary to DM 70K

Consultants, Project Leaders and Programmers are urgently required by a leading U.K. Systems House with a substantial overseas presence. Established project teams in W. Germany are currently developing mini and micro-computer based real-time software for a wide variety of clients. Applicants must have at least two years' experience of Assembler, Pascal or Algol gained in a real-time environment. Specialist expertise in the fields of Communications Networks, Message Switching or Process Control will be of particular interest. As a degree of customer liaison is required the ability to converse in German is essential although total fluency is not expected. Ref. L/7/C

Database Analysts/Designers

London & Berkshire: Salary to £13K

Our clients are seeking Database Analysts and Designers for their West End and Thames Valley offices. Applications areas will include manufacturing, production and materials control, scheduling and trend forecasting, budgetary control and cost analysis. Candidates must offer design experience in an installation which currently uses one or more of: IMS, TSO, DL/I, TOTAL, MVS, MAAPICS, or MRPS. A feature of these positions is the exteosive degree of client contact in the form of seminars, product demonstrations, feasibility studies and management reporting. The Company offers an extensive and worthwhile range of ancillary benefits. Ref. L/7/D

Process Control Programmers

London & H. Counties: Salary to £10K

A leading supplier of Industrial and Process Control Hardware and Systems Software is seeking to recruit Applications Programmers and Support Analysts for its U.K. Headquarters. It is obligatory for all applicants to have at least one year's experience in either Assembler or FORTRAN and those who have also had exposure to PASCAL, BASIC or COBOL will be of particular interest to our client. You will play a significant role in all stages of software and systems development from product planning to installation and live running. Since travel both nationally and internationally will form a significant part of the job function, mobility is an essential criterion for these positions. Ref. L/7/E

Logistix, 10 Grenville Place London SW7 4RW

01-373 3063 LOGISTIX Telex: 28800

4527

SENIOR PROGRAMMERS

2-3 years COBOL
Circa £9,000 + benefits
West London

Our client, a successful retail organisation, requires two experienced COBOL Programmers to work on the development of a major new system.

Utilising a 2900 backed by a 2946, candidates with 2-3 years' experience, preferably on ICL equipment, will be responsible for a team of programmers engaged in the new development work.

The company is committed to producing new systems using advanced techniques and applicants should have knowledge of Range COBOL, TPS, MTS, and PROSPER although full training will be given where necessary.

For further details —

Contact Mike Maunder on 01-235 9891 or on 04747 6566 evenings and weekends.

Ref 08/08

AGB Recruitment Limited

The Polytechnic of North London

POSTS IN MICROCOMPUTING

PROGRAMMER

The polytechnic is in the process of implementing interactive microcomputer based systems over a wide range of college administration including multi-use systems in the Finance Office and decentralised systems in Faculty Offices.

A Programmer with initiative is required to join the small Management Information Systems team to complete the implementation of existing programs, set up these as a multiuser system and subsequently develop other areas. Most programs have been written in C Basic. Experience in this particular language is not essential but experience of high level language programming is required.

TEMPORARY PROGRAMMER/ RESEARCH FELLOW

A graduate is required until the end of September 1981 to help complete a research project involving the development and programming of a distributed micro computer based system for handling student record, finances, high level language programming, not necessarily gained on micro computers, is essential.

TECHNICAL SUPPORT

The Polytechnic Computing Service operates a Microcomputing Centre for teaching and research, containing a wide range of equipment, e.g. Nascom, Pet, Apple, RM 380Z, Vector Graphics, and with facilities for colour graphics, digitising and plotting. Planned developments include resources sharing ring systems. Further technical support is now required in equipment maintenance, advisory services to users, and applications software. A Technician Grade 3 post is now available, for which the qualifications are ONC or OND or 2 'A' levels or Ordinary City and Guilds or equivalent. At least three years' experience (including training period). A Programmer appointment could also be available for graduates (or equivalent) with some programming experience preferably in the microcomputer field.

The Polytechnic's large DEC 10 will play an important back-up role and in all these posts there will be opportunities to gain experience of interfacing micros to mainframes at systems design and programming level.

Salaries are on the following scales (which include London Weighting), starting point will depend on qualifications and experience.

Technician (Grade 3)	£3,332-£6,000
Programmer	£4,377-£6,318
Research Fellow (Temporary Post)	£6,252-£8,924

Further details and application form (please state post in which interested) from Head of Computing Services, The Polytechnic of North London, Holloway Road, London N7 8DB. Telephone 01-607 2789 ext. 2295.

BANK of NOVA SCOTIA

PROGRAMMER ANALYST

We are seeking a programmer analyst – with a minimum of 3 years programming experience in RPG II – to work at our Berkeley Square offices. The system is based on an IBM System 3 and covers a wide range of domestic and international banking applications.

Salary will be experience related and the usual banking fringe benefits will apply.

If you are interested please contact J R F Barnett, Manager, Systems Department, 12 Berkeley Square, London W1X 6HU. Telephone 01-491 4200 extension 261.

(4403)

Scotiabank
THE BANK OF NOVA SCOTIA

THE POLYTECHNIC WOLVERHAMPTON

COMPUTER CENTRE

The Computer Centre provides a service to a wide range of students, academic and administrative staff, providing scientific, non-numeric, commercial and systems support. A large dual Prime 500 interactive system supports upwards of 70 terminals. There is a vacancy for a post of:

PROGRAMMER
(AP3/4/5/ £5178-£7212
From 1 April £5268-£7338)

Candidates should have a formal qualification, preferably to degree level with practical programming experience.

Further details from:

'Personnel'
THE POLYTECHNIC
Wolverhampton WV1 1SB
Tel. (0902) 710664 (24-hr. answerphone)

FIELD SERVICE SPECIALIST

Kingston £10-£12K + car

Established recruitment consultancy planning to double operations in 1981 offers unique opportunity for a young professional Computer Field Service Engineer to manage a rapidly growing Computer Engineering Division. Full training given in our proven systems. Lucrative financial package + Scope for advancement.

If you enjoy dealing with people – live locally and are ambitious telephone Ray Adams now!

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AB EXECUTIVE (KINGSTON)

MANAGEMENT & EXECUTIVE SELECTION

telephone 01-637 9611
9am-6pm

HIGH FLIERS

SALES PEOPLE £18k+car

Our client is expanding aggressively in the fastest growing sectors of the business computer markets.

They have asked us to select ambitious, high flying, sales executives to manage professionally sales territories in London or the Home Counties. The client's portfolio ranges from systems houses through to substantial multi-national companies so the successful applicants will be expected to negotiate effectively at the highest level.

If you take pride in the system you sell and wish to expand your career in a growing group of companies call Tony McGrath on 01-637 9611 today

Suite 201/6 Albany House 324 Regent Street London W1R 5AA 01-637 9611

MANAGEMENT & EXECUTIVE SELECTION

MANAGEMENT & EXECUTIVE SELECTION

telephone 01-637 9611
9 a.m.-6 p.m.

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London/Home Counties, Midlands/the North

£9K Basic + **HIGH COMMISSION SCHEME** + **Car**

If you're an OEM sales professional selling peripheral equipment you will know that very few companies have the resources of strength and product range to be expanding in today's market.

Our client is expanding its operations!

As an experianced sales person with the organisation you will be responsible for increasing their already considerable share of the market, particularly that of IBM; with a wide range of quality recognised products that includes VDUs, printers and disc drives.

You will find the management straight talking, honest, professional and realistic.

They provide their salesmen with the unbeatable combination of good technical back-up and good marketing, leaving their sales people to do what they're paid for SELLING!!!

If you know your job and want to work in an environment where you can earn the sort of money you want and progress in the way you want call Robin de Rouan on 01-637 9611.

Suite 201/6 Albany House 324 Regent Street London W1R 5AA 01-637 9611

MANAGEMENT & EXECUTIVE SELECTION

Swiss Life

COMPUTER MANAGER

SEVENOAKS

Up to £15,000 + Assisted Mortgage

The United Kingdom Branch of a leading international life assurance and pension company wishes to appoint a Computer Manager.

He/She will be responsible to the United Kingdom Manager in the development and installation of a new Honeywell 64 computer, eventually covering all aspects of the Company's business using contemporary techniques. Candidates should be aged under 40, with previous experience of a modern computer installation at a reasonable level; some previous experience in life assurance or pensions business is desirable and experience of Cobol and on-line systems will be relevant.

The personal ability to mix at different levels, allied to enthusiasm and the will to succeed in a growing organisation are considered essential qualities.

An initial salary of up to £15,000 p.a. is envisaged together with assisted mortgage. Relocation costs will be considered.

This appointment is open to both male and female candidates who should send adequate particulars initially, in confidence, to:

J. W. Manston, United Kingdom Manager
SWISS LIFE INSURANCE AND PENSION CO.
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4569

UNIVERSITY COLLEGE CARDIFF
COMPUTING CENTRE

Applications are invited from graduates for the post of

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(MICROPROCESSOR SUPPORT)

in the recently established MICROPROCESSOR SUPPORT UNIT in the Computing Centre. The post carries responsibility for user liaison and advice, evaluation and support of software and microcomputers, user education, and dissemination of information on microprocessor related developments. The person appointed will work with the Microprocessor Systems Officer, already in post, in developing the work of the Unit and will be expected to liaise with microprocessor specialists at other locations and to maintain awareness of development in the field.

Applicants should be graduates with thorough knowledge of hardware and/or software aspects of microprocessors, together with an ability to communicate with non-specialists.

The appointment will be for five years from the date of commencement and will be on the scale OR 1A (£5606-£6695) or 1B (£4795-£6206). Duties to commence as soon as possible.

Applications (2 copies), together with the names and addresses of two referees, should be forwarded to the Vice-Principal (Administration) and Registrar, University College, P.O. Box 78, Cardiff, CF1 1XL, from whom further particulars may be obtained. Closing date: March 7, 1981. Reference 2177.

[4489]

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[4481]

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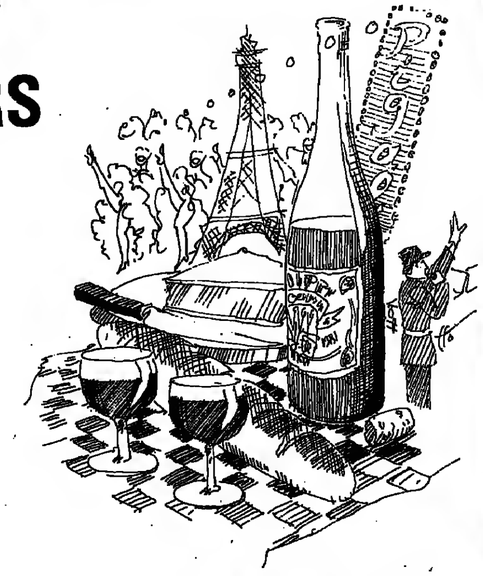

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4512

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DOS/VS(E) SYSTEMS PROGRAMMER — EINDHOVEN

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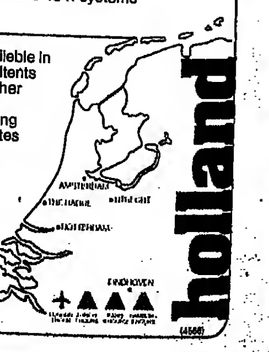

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(4556)

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is required for a project in the Department of General Practice involving the Patients Records/Prescriptions at the Thamesmead Health Centres. Knowledge of FORTRAN with at least two years' practical experience is essential. The appointment is for one year initially.

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MANAGEMENT & EXECUTIVE SELECTION

(4528)

MANAGEMENT & EXECUTIVE SELECTION

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Full systems ... Timap engineers ... Siberia will be ... plus ... and living allo... should any ... considered. ... the USA will ... life.

Please call ...

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Applicants should be able to demonstrate a successful track record in the planning, implementation and management of large scale communications networks and associated business systems, not necessarily in the travel industry, but this would be advantageous. A mature business acumen and the ability to implement decisions is of prime importance.

Ten years practical experience in the relevant areas and the ability to organise and direct supporting staff, plus demonstrative negotiating skills with external bodies are considered creditable attributes.

Please apply with comprehensive career details including scope of present responsibilities to:

Margaret Stevens,

JAMES BAKER ASSOCIATES,
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32 Savile Row, London W1.
Tel: 01-439 9311

(4618)

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Salary and other benefits will reflect the importance of this position.

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Applications, giving full details of age and previous experience, in writing to:

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To work on an IBM 3033 running under MVS. The successful applicant will have at least two years' experience of generating, maintaining and enhancing MVS, together with a good knowledge of related program products. He or she will work within a small team environment, and will be responsible for all aspects of operating systems and software support. *Ref: 01/Tim Armstead*

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LONDON & HOME COUNTIES **to £15,000**

An expanding Computer Services Company seeks professional Consultants, Analysts and Programmers to work on the development and implementation of commercial, technical and software applications. Both mainframe and mini backgrounds could be of interest. Ability to accept responsibility and work in a small project team environment is important. *Ref: 02/Tim Armstead*

PROJECT TEAM
WEST END **£7.5k-£10.5k +**

This new team comprising a Senior Analyst Programmer (c. £10.5k), an Analyst Programmer (c. £8.5k) and a Programmer (c. £7.5k) will work on various commercially oriented projects in a manufacturing head office environment. Most of the work will be developed on Honeywell L 6/47 with some use of terminals linked to a Honeywell L 66 mainframe. Benefits include: 5 weeks' holiday, flexitime, subsidised meals and contributory pension scheme. COBOL experience is essential. *Ref: 03/Ian Murray West*

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Our client, who market and support their own products, are looking for experienced Systems Programmers with a good appreciation of the IBM O/S operating systems software. *Ref: 04/Steve Gill*

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A leading WP/Mini manufacturer requires Salesmen to sell and manage an area. Minimum of 2 years selling word processing or mini based systems in the end user market place is necessary. *Ref: 05/Steve Gill*

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On quota earnings £20,000+

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CURRENT CONTRACT VACANCIES INCLUDE:

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● IBM 3270 Software Specialists	ITALY

Rates negotiable from £400 per week
Ref: 07/Tim Armstead

For further information, please contact the appropriate Consultant on 01-493 2947, during office hours, or, if more convenient, Tim Armstead on 01-782 5384, Ian Murray West on Milton Keynes (0908) 563415 or Steve Gill on Bedford (0234) 856133 evenings and weekends.

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(4641)

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for London and the South East

c. £15,000 + Car

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Almarc now require a Sales Engineer who has existing experience of computing and computers, and especially the micro-computer market. He/she will possibly be aged 25-35 years and be fully conversant with selling into a scientific/technical market. There are substantial prospects for development within this fast growing company and the successful candidate will earn in the region of £15,000 during the first year.

Application should be made in writing including all relevant details, marked Private & Confidential to:

David Swain,
Sales Director,
Almarc Data Systems,
906 Woodborough Road,
Nottingham NG3 5QS.

(4627)

UNIVERSITY OF STRATHCLYDE
DEPARTMENT OF COMPUTER SCIENCE

LECTURER

Applications are invited for the post of Lecturer in Computer Science. Applicants should have research interests in non-numerical computing. The appointment will commence on 1 August 1981 or as soon as possible thereafter.

Salary Scale £6,186 - £11,679 (under review)

Applications, together with the names of three referees, should be submitted by 4 March 1981 to the Secretary (GR), University of Strathclyde, Glasgow G1 1XH. Tel: 041-552 4400 (ext. 2334) from whom further particulars may be obtained.

(4677)

MICRO COMPUTER PROGRAMMER

Small go-ahead software house specialising in Micro Mini user systems have a vacancy for an experienced BASIC programmer. Some commercial experience would also be advantageous.

Salary negotiable.

Phone Orpington 25807
Micromedia Computer Services

(4674)

SALES BIT

Professionalism is a label that has to be earned

I WAS asked recently to give a talk to the employees of a Scandinavian computer company at its annual international convention. It was particularly gratifying that the chosen topic was not some aspect of selling technique or "how to make annual sales quota in the first fortnight", but a more profound and important topic — the importance of being professional.

Everyone wants to be thought of as "professional" if they are really good at their job, no matter what their occupation. The trick is actually getting there.

The dictionary tells us that a professional is one who earns a living by practising an art, sport or non-manual job function. In reality, common understanding of the term implies an overlay of excellence.

Being a professional is not simply a matter of playing a part; it is more the achievement of unquestionable capability, not only in the mechanics of a job, but the way in which it is performed.

Being a sales professional is not a sales technique, an affectation or so endowment of nature; it is a manner of behaviour that transcends the vagaries of selling achievement. There is no training course nor formal qualification in professionalism, it is a label that has to be earned.

It is not sufficient for salespeople to appear professional; their professionalism has to be proved over and over again with every customer and at every stage of the sales negotiation, by virtue of actions as well as words. The sale can never be truly closed until this level of empathic understanding and acceptance is established. Let us call it professional credibility.

During the era of Richard Nixon and Watergate, someone coined the expression "Would you buy a used car from this man?" In every new sales call, the potential customer, either consciously or subconsciously asks himself this same question.

Consider the insecurity of a buyer who is contemplating the purchase of a complex piece of high-technology equipment, or perhaps a change of supplier for a commodity on which his company is entirely dependent. His head is on the block. His personal status as well as the well-being of his employer is at risk.

Every salesperson he has met from the various potential suppliers will have put forward plausible reasons why their product is superior to the rest and he can perceive that all the possible alternatives have individual strengths and weaknesses.

What should he do?

Trust

Go for the cheapest, the fastest, the most readily available, the most aesthetically satisfying? No — generally he will go for the solution that is able to satisfy the basic need with the least risk. But how does he define what constitutes risk?

It is usually something as simple as trust; complete faith in the ability of both the salesman and his company to satisfy his needs completely on a continuing basis before and after the sale. In other words, professional credibility.

Usually this consideration is of greater significance to the buyer than the product itself.

Next week I shall write about the principal factors involved in the establishment of professional credibility within the sales situation. I am sure there will be no surprises!

Alan Williams

COURSES

Introduction to robots

■ Computerised robots is the theme of a four-day course to be held at the Polytechnic of Central London from March 17-20. The course is claimed by organiser ICS to be the first of its kind. It provides an introduction to computerised robot technology and practical techniques for identifying and implementing robot application. Production and technical managers, design and manufacturing engineers, systems analysts and programmers are expected to find the course useful. For further information, contact ICS Publishing (UK), Pebblecoombe, Tadworth, Surrey, KT20 7PA.

■ A residential workshop on data analysis, will be held at the Queen's Hotel, Eastbourne from March 23-27. Organised by BIS Applied Systems, the course aims to provide delegates with an understanding of new methods in data analysis and logical design, and the skills to define data and its structure within a system or business. The workshop stresses the use of standard methods of analysis and documentation. Fees is £335+VAT. Details from Jackie Preuss on 01-261 9237.

■ Computer ergonomics involves the use of traditional ergonomics (study of man in relation to his working environment) with recent knowledge about ergonomics specific to computer use. A course on this subject, organised by Husat, will be held from March 22-27, May 31-June 5 and September 20-25 at the University of Technology, Loughborough. Details from J. S. Wilcox on Loughborough (0509) 63171 Ext 392.

■ Interest in APL has increased rapidly and Allan D'Morias Associates has designed a series of courses. Two introductory courses are to be held: the first, from March 18-20 and May 13-15, costs £220+VAT; the second from March 23-27 and May 8-22, costs £330+VAT. An advanced APL course will be held from April 1-3 and again from May 27-29, and the fee is £250+VAT. On March 31 and again on May 26 a one-day seminar, APL Management, will be held. The fee for this is £80+VAT. All courses take place at ADM's offices in Harrow. For further information contact R. Hunibel on 01-863 0621.

PUZZLE ANSWER

A SUITABLE series of captures is: 3 × 11, 9 × 10, 1 × 2, 7 × 15, 8 × 16, 8 × 7, 5 × 13, 1 × 4, 8 × 5, 6 × 14, 3 × 8, 6 × 3, 6 × 12, 1 × 6, 1 × 9.

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The Country's most successful Recruitment Service

Data Processing Manager
Manchester — To £10,000

This manufacturing Company is seeking an experienced Computer Operator. The position of Data Processing Manager provides an excellent opportunity for a young programmer/analyst to take their first step into management. Responsible for operating and maintaining the hardware, you will be involved in the complete software review that is currently underway. A solid programming background in COBOL, practical systems analyst experience and the ability to develop new systems are prime requirements. The position offers total responsibility, full involvement and first-class career experience.

Telephone: 061-832 6631 (24-hour service) quoting Ref. 2243/CW, Reed Executive Selection Limited, 15 Piccadilly, Manchester M1 1LT.

(4818)

The above vacancy is open to both male and female candidates

London · Birmingham · Manchester · Leeds

Computer Service Engineers
minicomputer systems

Our client is a significant American manufacturer of minicomputers which incorporate a sophistication of technology which is the envy of the industry. Very rapid expansion of this service orientated company has created an opportunity for experienced customer service engineers to join a highly talented team which provides hardware field service throughout England and Scotland.

The requirement is for self-starters with a minimum of two years experience in providing technical field service to minicomputer installations which include printer and disk devices. The ability to absorb training and the ambition to make a long-term successful career is vital.

Terms include a competitive basic salary, bonus, company car and those benefits associated with a highly successful, forward-looking, international organisation. Location: South/South West England.

Please telephone W. H. Pierce in complete confidence.

PDL SELECTION DIVISION

PETERSON DAVIDSON LTD
Heron House 19 Marylebone Road
London NW1 Tel: 01-486 8991

WYCOMBE DISTRICT COUNCIL
TREASURER'S DEPARTMENT

COMPUTER MANAGER

GRADE – PO.1 (6-10). SALARY – £9,411-£10,542 P.A.

The district Council is setting up a New Installation based on an I.C.L. ME29 Model 36 machine, to replace an existing 7503 installation working solely under RJE, and gives the Authority an opportunity to continue with the existing RJE link to the Bucks County Council computer whilst up-dating the Date Preperation process and providing for future growth via local processing.

This will include in the first instance the operation of a new system within the Housing Maintenance Section.

The Computer Manager's job will be to oversee initially the transfers from the existing machine to the new machine in September 1981 subsequently for the day-to-day running of the installation, together with systems and programming involvement in the implementation of some package software and the production of a development programme for the future within the Authority.

Responsible to the Computer Manager initially will be a Programmer/Analyst, a Machine Operator and three Data Preperation staff and the Authority is looking for an enthusiastic individual who feels they are able to contribute to the future development of a small computer installation.

The following generous fringe benefits may apply.
Housing accommodation may be available for married person.
Casual User car allowance. Assisted car purchase scheme.
100% removal expenses. £250 disturbance allowance payable.
Lodging allowance of up to £15 per week for a maximum period of 6 months where appropriate.
75% Legal and Estate Agent fees paid.

Anyone wishing to have further information concerning the appointment should contact the Deputy Treasurer Bruce Berrel, High Wycombe (0494) 26100, Ext. 222.

Vacancy open to both men and women. Applicants for appointment must enclose a stamped, addressed envelope. Applications welcomed from disabled persons with appropriate qualifications or experience.

Application forms and particulars available from PERSONNEL MANAGER, Council Offices, Queen Victoria Road, High Wycombe, Bucks. Tel. High Wycombe (0494) 26100, ext. 264.

Closing date 11th March 1981.

SENIOR SYSTEMS ANALYST On Line development with Burroughs/DEC Hardware.	HERTS	To £11,000
SYSTEMS PROGRAMMER Knowledge of UNIVAC/IBM with TIPS, CMS/CICS essential.	BUCKS/HERTS	To £10,000
PROJECT MANAGER Fortran background with HP Hardware.	BUCKS	To £10,000

Phone or write for further details/application form to:
HOWLETT COMPUTER SERVICES
Revenstone Chambers, 23 High Street
Leighton Buzzard, Bedfordshire
Tel. 0525 384735 or 377519, evenings/weekends (4556)

HOWLETT COMPUTER SERVICES

NORTH YORKSHIRE COUNTY COUNCIL

Senior Assistant County Treasurer
and
Head of Computer Services

£14,286-£15,177 (from 1st April, 1981)

Applicants should be computer enthusiasts with experience of the administration of a major computer installation. With a current staff of 74, the successful applicant will be responsible to the County Treasurer for managing the authority's ICL 2976 and 2970 systems operating under VME/B; providing a comprehensive computer service to all departments of the County Council, several District Councils and other bureau users; and developing advanced computer systems.

Apply, giving full personal details, summary of previous experience and names of two referees, to County Treasurer, County Hall, Northallerton DL7 8AL (tel. Northallerton (0609) 3123 Extension 406). CLOSING DATE 21ST FEBRUARY, 1981.

(4354)

HP 3000 — £8,000+ — Location: Hants

COMPUTER MANAGER

Expanding Book Distribution Company, retailing and wholesaling, requires an energetic person to take control of their recently installed Computer Systems and all future developments. He/she will be responsible for a staff of ten.

Using the HP 3000 series 3, the application revolves around Stock Control at several locations and takes in such technology as Lightpens and OCR and a Print. The extension of point of sale units in retail outlets is planned.

The applicant should have HP 3000 operational and COBOL programming experience, and be looking to extend their skills into the general management field.

Apart from pay the benefits include 4 weeks' holiday (5 weeks after two years) and pension scheme.

For an application form please contact:
Mrs. B. Phillips—Personnel Manager
HAMMICKS BOOKSHOPS LTD.
16 Newman Lane, Alton, Hants GU34 2PJ
Telephone Alton (0420) 85622

GUIDE TO RECRUITMENT CONSULTANTS IN THE U.K

LONDON & H. COUNTIES (LH). MIDLANDS (M). NORTH (N). SCOTLAND (S). OVERSEAS (O)

NORTHERN IRELAND

ALL COMPUTER STAFF NEEDS

Ivor Norton Management Services Ltd
Recruitment Consulting Division

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FOR FURTHER DETAILS OF THIS WEEKLY FEATURE CONTACT OWEN KELLY

Insight Marketing & Personnel Consultants
SALES Appointments

GRAPHICS - MANCHESTER & NORTH - £17K + Car
Sales of Graphics systems - top flight manufacturer - new and exceptional opportunity. Salary - £14K
Contact: Manchester Office, Ref JVB/9

MINI COMPUTERS - WEST MIDLANDS - £18.5K
Commercial environment - major account management and new business - first class company - with exceptional record. Salary - £8.5K
Contact: Manchester Office, Ref JVB/10

LONDON - W.P. EXECUTIVES - £30K + Car
February is the launchdate for this revolutionary UK designed and manufactured Word Processing Computer. It boasts a cost/performance ratio to beat the world. Proven Major Account sales executives are sought to address Government, Finance and Blue Chip institutions. £10K base salary.
Contact: London Office, Ref DS/3

SURREY - MAJOR ACCOUNTS - £15K
Mature, proven individuals are invited to discuss this responsible senior sales opportunity. The company is a worldbeater and the opportunity unique.
Contact: London Office, Ref DS/2

SBS & TERMINALS - DUBLIN - £17K + Car
Sell for the most successful computer company in Ireland last year.
Contact: Dublin Office, Ref PR/1

MEDIA - DUBLIN - £16K + Car
Start-up opportunity selling consumables to OEM and users. Salary - £10K - £12K.
Contact: Dublin Office, Ref DM/2

COMMERCIAL SYSTEMS - CORK - £8K - £14K
Selling into existing user base with second largest computer company in Ireland.
Contact: Dublin Office, Ref PR/3

MINIS - BELFAST - £17K + Car
Sell a broad range of technical and commercial mini computers. Start-up situation, high guaranteed income.
Contact: Dublin Office, Ref DM/4

MICROS: DUBLIN - £17K + Car
Selling commercial, technical & OEM. Salary - £10K.
Contact: Dublin Office, Ref PR/5

BEDFORD - RETAIL SYSTEMS - £16K + Car
A "groundfloor" opportunity to join a new division of an established and stable organisation. P.O.S./retail systems experience an advantage. £8.5K base salary.
Contact: London Office, Ref DS/1

OEM - MIDLANDS/EAST ANGLIA - £17.5K + Car
World leading multinational company - micro/ mini computers and terminals. Salary - £10K.
Contact: Manchester Office, Ref JVB/1

R/T MINIS - NW AND YORKS - £15K + Car
End-user sales of real time, multiprogramming, computer based systems - Business applications - network - wholly owned British Company.
Contact: Manchester Office, Ref JVB/2

DATA ENTRY SYSTEMS - NW AND YORKS - £15K + Car
Key-Disk data entry systems with applications processing ability - UK Company - large existing user base. Salary - £7.5K.
Contact: Manchester Office, Ref JVB/3

BUSINESS COMPUTERS - SCOTLAND - £17K + Car
Range of machines form single terminal to 200 terminal configuration - UK Manufacturer. Salary - £7.5K
Contact: Manchester Office, Ref JVB/4

WORD PROCESSING - NORTH WEST - £14K + Car
One to multi keyboard - existing large user base - main distributor - exciting position with new company. Salary - £7K.
Contact: Manchester Office, Ref JVB/5

CAD/CAM - MIDLANDS & NORTH - £23K + Car
Exceptional sales opportunity with Manufacturer of CAD/CAM systems - exceptional growth company. Salary - £9K.
Contact: Manchester Office, Ref JVB/6

BUSINESS SYSTEMS - YORK - £16.5K
Mini manufacturer - distributed processing systems - sound existing user base. Salary - £8.5K.
Contact: Manchester Office, Ref JVB/7

W.P./COMPLEX COMMS NETWORKS - EAST MIDLANDS - £27K + Car
Major accounts environment and new business - leading company - top benefits - exceptional prospects. Salary - £11K.
Contact: Manchester Office, Ref JVB/8

UK WIDE - MINIS - £16K + Car
Experienced computer salesmen are urgently needed by a leading international manufacturer, selling mainly to OEM's. Full training given in USA. Applicants must be ready to start quickly.
Contact: London Office, Ref AVP/1.....

LONDON - TELECOMMS - £16K + Car
Would you like to sell mini computer systems and IBM terminals for a major British Communications company? Preference given to technical expertise and knowledge of production control. Salary - £9K.
Contact: London Office, Ref AVP/2.....

SURREY - BUSINESS SYSTEMS - £17K + Car
A computer person with a good technical background is required for this top-flight position to handle MAJOR ACCOUNTS only. Selling experience is less important than technical ability. This would be your chance to break into selling.
Contact: London Office, Ref AVP/3.....

HOME COUNTIES - MINIS £18K + Car
A new company is being formed by two existing organisations to develop the sale of business systems. They are looking for a computer salesman to head up the sales organisation. Experience of mini-computers and commercial systems is essential. Salary - £18K.
Contact: London Office, Ref AVP/4.....

LONDON - MAJOR ACCOUNTS - £16K + Car
A major international computer manufacturer needs a computer professional to handle major accounts based in West London. Knowledge of computer applications is essential. Training in the USA.
Contact: London Office, Ref AVP/5.....

FINANCE MKT - CITY OF LONDON - £15K + Car
Selling to Banks, Stock Brokers, Insurance Orgs. Computer Systems & proven applications. Mainframe manufacturer. Defined market with rewarding opportunity.
Contact: London Office, Ref ODH/1.....

BRISTOL - BUSINESS SYSTEM - £17K + Car
Well established manufacturer, excellent products & support. Good user base. Training programme. Must be experienced professional salesman.
Contact: London Office, Ref ODH/2

STRATEGIC ACCTS - CITY OF LONDON - £18K + Car
Senior sales International Terminals Co. negotiating multi-million £ orders to financial/banking houses. Base salary - £12K.
Contact: London Office, Ref ODH/3

ACCOUNT EXECUTIVE - LONDON - £20K + Car
Sales experience in business systems or IBM 3270 replacement systems to Universities, Public Utilities & Commercial. Training in USA. Promotional opportunities.
Contact: London Office, Ref ODH/4

MAJOR ACCOUNTS - LONDON - £22K + Car
Marketing high volume/low cost electronic monitoring systems, into major business/financial houses. Base salary £12K plus equity participation. Unique opportunity for entrepranours.
Contact: London Office, Ref ODH/5

COMMS/TERMINALS - SOUTH - £16K + Car
Sell distributed systems to household name companies and major IBM users. Other salesmen have earned £20K - £30K p.a.
Contact: London Office, Ref JFEG/1.....

MFTG SYSTEMS - LONDON - £18½K to £22K
3 sales executives required for international systems company to sell manufacturing systems to industry. New division with many qualified prospects and installed base. Salary - £8½K to £12K.
Contact: London Office, Ref JFEG/2.....

CAD/CAM - UK & EUROPE - £20K + Car
South & Midlands plus European sales opportunities to sell complete CAD/CAM & Graphics systems. Salary - £10K + guarantee.
Contact: London Office, Ref JFEG/3.....

TERMINALS/PERIPHERALS - NORTH/SOUTH - £16K + Car
Selling terminals & communications to large computer users and OEM's Southern & Northern offices.
Contact: London Office, Ref JFEG/4.....

BUREAU SERVICES/MINIS - SOUTH/MIDLANDS - £16½K + Car
Large service bureau/OEM company needs sales executives for London/Home Counties/Midlands. Salary - £8.5K +, benefits.
Contact: London Office, Ref JFEG/5.....

SYSTEMS CONSULTING - LONDON - To £30K + Car
Senior Sales Executive to start up new commerical division of international software house. Excellent salary and potential enormous.
Contact: London Office, Ref JFEG/6.....

CITY - HARDWARE - £13K + Car
ENGINEERS?? This could be your opportunity to begin a sales career. Ideal candidates will have a knowledge of DEC or other mini computer hardware, and will be good communicators with a real desire to "go-selling". Salary - £7K.
Contact: London Office, Ref DS/8

WEST LONDON - SERVICES - £20K + Car
The marketplace is the exploding information processing industry. The company, the MARKET LEADER, has enjoyed more than ten years uninterrupted growth. Polished professionals are sought with a sound data processing industry background and ideally, a knowledge of IBM systems. Salary - £8K.
Contact: London Office, Ref DS/4

If you need advice about advertising, contact John George in London.

TOP JOBS FOR TOP SALES PEOPLE

I.M.P.C. THE PROFESSIONALS IN RECRUITMENT FOR THE COMPUTER INDUSTRY

LONDON
72-75 Marylebone High Street
Phone: 01-486-8644

MANCHESTER
Austin House, Charlotte Street
Phone: 061-236-2026

DUBLIN
20 Upper Fitzwilliam Street
Phone: 0001-606644